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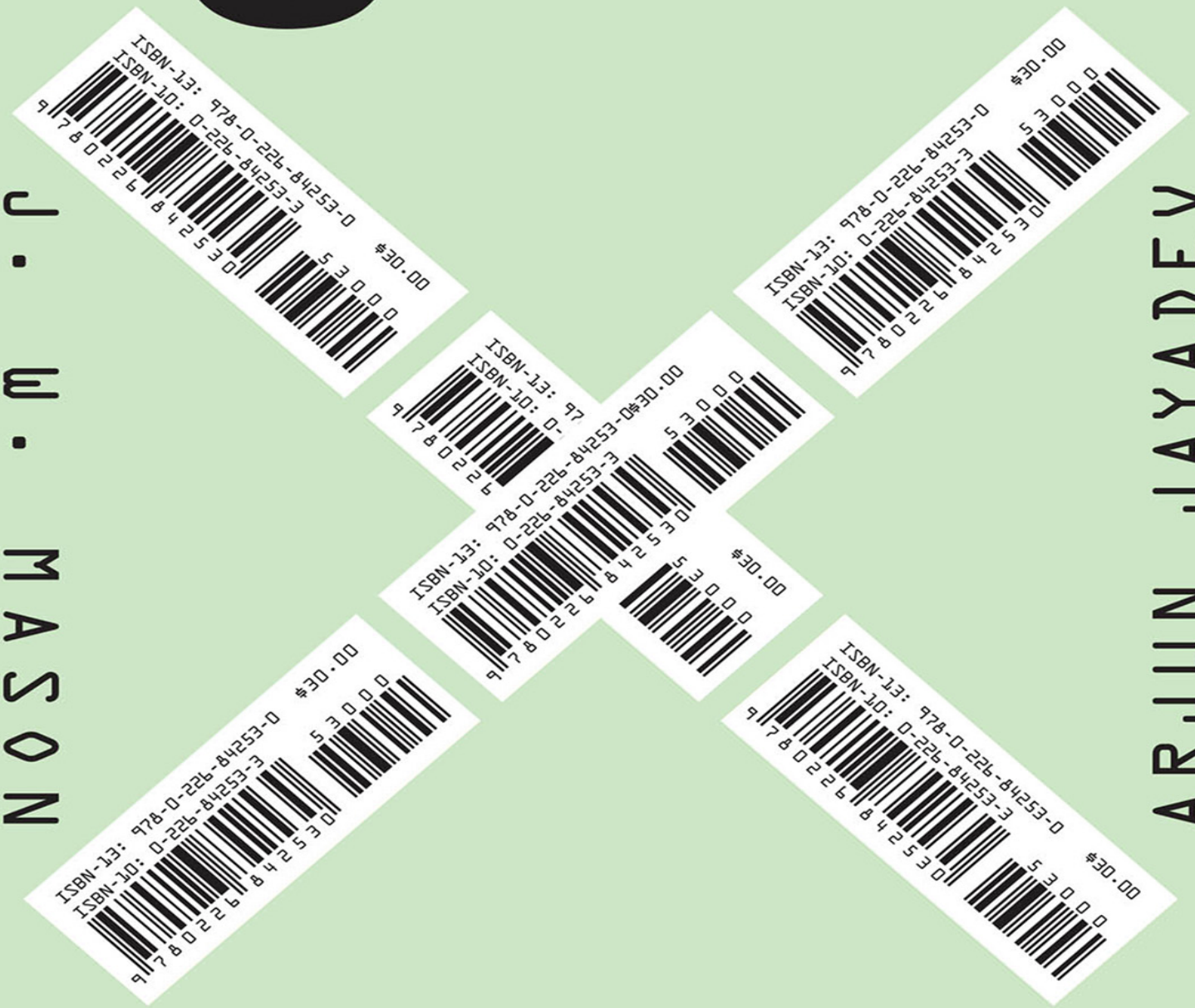

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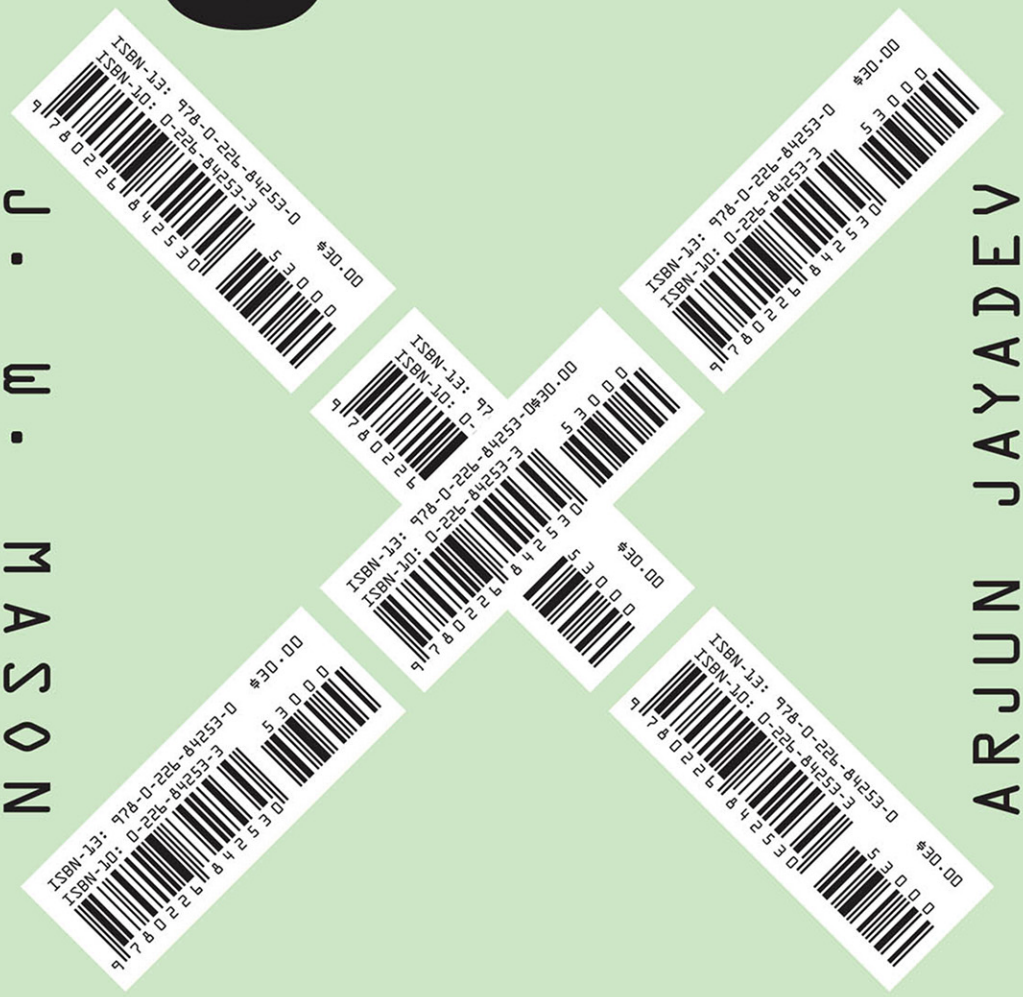

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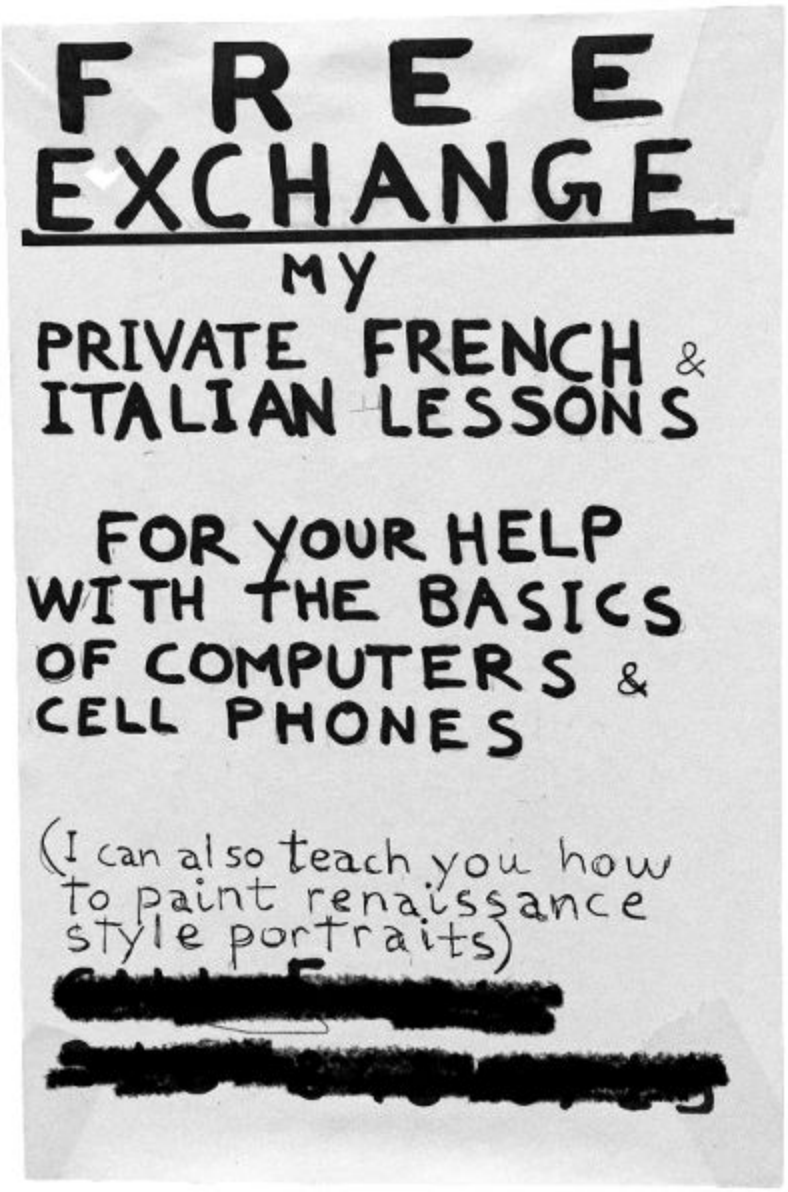

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Against Money

J. W. Mason and Arjun Jayadev

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To our families: Laura, Eli, and Abe;

and Kade, Azad, and Mallika.

And to the memory of Jim Crotty.

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Part 1

Beginnings

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Introduction

Money and Things

Walk down any street and look around. The buildings you see will vary in their construction: one, two, or many stories; made of wood, brick, concrete, and steel; heated with oil or gas, cooled with fans and air conditioners; with doors, windows, flat, or peaked roofs. You can give a physical description of them—casual for most of us, more detailed if you're trained as an architect or engineer. If you could disassemble them, you could put numerical values on the buildings' differences—so many bricks, that much length of wire and pipe, different quantities of tiles and glass.

The construction and maintenance of these buildings requires the coordinated activity of an enormous number of people, spread over space and time. Different people dug up the clay, shaped and fired it into bricks, carted them to the site, and mortared them in place. Human beings laid the wires and pipes, and others kept watch in the power plants and sewage treatment plants to ensure that the electricity and water kept flowing.

All of these actåivities, linking people who will never meet or even be aware of each other, have to take place in sync. If you watched long enough, from enough vantage points, you could see all this activity take place just as you see the buildings today. Perhaps, if you have small children, you have stood by a construction site and watched and watched it. Each of us often has, with our own children.

But these same buildings have another set of qualities, which are not visible to the senses. Every building has an owner, a party with exclusive rights to it. Each building has a price, reflected in some past or prospective sale and recorded on a balance sheet. All of these buildings generate a stream of money payments—some to the owner, including from tenants to whom some of the owner's rights are delegated as well as to mortgage lenders and tax authorities, whose need for payments keep people laboring so they can afford to live in the building.

Like the bricks in the building's walls or the water flowing through its pipes, these qualities are quantitative: they can be expressed as numbers. But unlike the differences in those physical quantities, all of these can be expressed in the same way: as dollars or other units of currency. Part of the identity of the thing is what it means in terms of money.

It is impossible to observe this second set of qualities in the physical building, no matter how microscopically you examine it. These qualities are invisible, immaterial—no physical examination of the building will ever tell you who owns it or how much it cost. But these invisible qualities shape our relationship to the building as much as any of its physical properties. Where you carry out your daily activities of life and work depends entirely on who owns which buildings, which in turn depends on the invisible price tags they carry. And the collective activity of creating new buildings, and improving and maintaining existing ones, is guided by beliefs about the flow of money payments the buildings will generate.

These invisible qualities also involve coordinated human activities, including our collective capacities for coercion and violence. (This part becomes clear if you try to ignore the property rights attached to a building and someone calls the police.)

We take it for granted that our world has this double nature. Like most human societies, we all know that an invisible network of forces lies behind and directs the material world. But as much as medieval Christians or any premodern people, or many people of faith, we believe that we live at the mercy of invisible forces, that the objects around us have both a profane material aspect and a sacred immaterial one. If we listen to historians and anthropologists, this kind of belief is normal, even universal—a long-standing human shorthand for the necessary exchanges of life on Earth. But when we think about it as part of our own social universe, it also seems very strange.

It is strange, isn't it?

In daily life we don't think much about the separation between the world of concrete reality and the world of money. If you pick up a real estate listing, you'll read about a three-bedroom brick house for sale for $500,000 in the suburbs, or a flat in Mumbai for Rs. 20 crores. The size, location, and price are, it appears, a set of ontologically equivalent facts about the building, all on the same level. This is perfectly reasonable at the level of

the individual participant, because monetary and material facts appear equally objective: The price of something is as black and white as the materials it's made of. But when you look at the system as a whole, from the outside, the existence of these two superimposed worlds is far from natural or obvious. It's a puzzle, and a problem.

To those whose vocation it is to understand the money world—economists and the like—there are two quite different answers to this puzzling coexistence of a money world and a material world.

The first answer is that the money world is not an independent reality but simply a convenient shorthand for describing the material world. In this view, you *can* in fact learn the price of the building by a sufficiently careful physical examination of it. The price simply reflects the building's capacity for satisfying human wants—with the latter as well as the former physical facts about the world. Nor does who owns the building represent a distinct fact—the market system will ensure that whoever initially owns it, it will end up owned by whoever gains the most satisfaction from it, with satisfaction again conceived of as a material thing. So there is no distinct immaterial world of prices and money payments, there are simply physical activities satisfying physical needs, whose content is unaffected by the fact that we happen to use money values to describe them.

The second answer that an economist might give for the existence of a money world on top of the physical world is that the network of money values and payments coordinates the concrete physical activity that produces the building. Without a system of money payments, there would be no way for the anonymous labor of the clay diggers, the brickmakers, the carters, and the masons to take place in harmony, no way for them to work together without an inflexible, coercive authority from the top. It is the homogeneity and anonymity of money that allows for productive cooperation between strangers. And it is the money prices and values on balance sheets that allow that productive cooperation to be directed toward its most valuable use. Without the lure of prospective rents, who would know whether to build an apartment building, an office, or a factory, or where to site them? It is, in this view, only thanks to the fact that we follow voices from the invisible world, that we are so successful in shaping the visible one.

There is a tension between these ideas—one that holds that money doesn't matter, the other that money is useful or even essential. In economics, this tension is present from the first economics textbook students read. Students are taught that money is a great advance over a system of barter *and* that a world of money produces exactly the same outcomes as a world of barter. But both things cannot be true at once: If barter and money produced the same ends, then why do we use one at the almost complete exclusion of the other? Are we really to understand that money reflects the physical world without changing it?

These frictions are generally kept out of view, and the two perspectives cohabitate peacefully as orthodoxy in economics and public debates. But the contradiction remains. It's something we have been struggling with since our earliest years as economists.

*

Sometime in the fall of 2001, while in our first years at graduate school, the two of us drove in a typically rickety graduate student car (a thirdhand Ford LTD, built around 1983) across the breathtaking Berkshire mountains of western Massachusetts to Bard College, home of a think tank called the Levy Institute. There, tucked in a small liberal arts campus in the Hudson Valley, the most important figures in the Post Keynesian school of economics gathered to celebrate the life and work of Hyman Minsky, an American economist whose work on financial crises—and especially the role of debt and speculation in their formation—was foundational to the Post Keynesian tradition. The conference featured leading lights from academia, policymaking, and business. For young graduate students, it was a fascinating and dizzying set of discussions. It also made clear how deep questions about money lay at the heart of other debates in economics—and how contradictory and unsettled the answers were.

At the time of the conference, the US economy was in the midst of an extended period of stability—a "Great Moderation," credited to Federal Reserve Chair Alan Greenspan by some media (and some economists). This made the proceedings of the meeting—a discussion of financial crisis in the midst of extended financial stability—a vivid illustration of the tensions inherent in prevailing views about money.

A presentation by an economist from Bank One (a retail bank acquired three years later by JP Morgan Chase) cheerily forecasted continuing good times despite what the economist described as “frothiness” in the stock market—assets rapidly increasing in value at unsustainable levels.[1] (The US would go into its first recession in a decade about six months later.) The hero of the economist’s talk was the Federal Reserve, the US central bank, and in particular Greenspan. The economist’s description of the Fed chair was admiring, almost tender—comparing him to a kindly gardener who knew just how much sunlight to bestow upon the plants, or to a father figure who could keep his profligate and dissolute children on the right path.

The turn of the century was the high noon of the central banker. Alan Greenspan’s long tenure as Fed chair and his helmsmanship of what was widely seen as a robust economy made for a hero worship that is hard to describe a quarter century later. Bob Woodward’s worshipful biography *Maestro* came out that year.[2] In 1999, *Time* magazine had put the Fed chair and two others (Robert Rubin and Larry Summers) on their cover as “the committee to save the world” (the turn of the century was also the heyday for unabashed US triumphalism). The business magazine *The International Economy* went even further, putting him on its cover in full papal regalia, as “Alan Greenspan and His College of Cardinals.”

Dissenting perspectives on the economy were scarce in the early 2000s; the economist Marvin Goodfriend’s widely cited “How the World Achieved Consensus on Monetary Policy,” published in one of the American Economic Association’s flagship academic journals, is characteristic of the debates (or lack thereof) of the period.[3] This new orthodoxy was centered on the absolute power of central banks to control a target interest rate and, with it, financial conditions throughout the economy. Macroeconomic policy, then, could be reduced to the question of how the central bank should best use this power.

As with all such settlements, the contours of the consensus became apparent only after the fact. But already by 2003, this policy approach was formalized by Michael Woodford, perhaps the best-known macroeconomist of his generation. As he wrote: “What appears to be developing, then, at the turn of another century, is a new consensus in favor of a monetary policy that is disciplined by clear rules intended to ensure a stable standard of value, rather than one that is determined on a purely discretionary basis to

serve whatever ends may seem most pressing at any given time."[4] Woodford's work was a departure among economists at the time for describing monetary policy without any reference to money; in his telling, the central bank simply sets the interest rate (somehow) and the rest of the economy responds, without any role for a special asset used for payments or settling debts. But even while he removed money from the models, his central claims about it were drawn from the long-standing catechism of monetary orthodoxy: That money can and should serve as a "stable standard of value," something that implicitly exists independently of it; that low inflation was therefore the single goal in this sphere; and that there are an objective set of rules to bring this about, eliminating the need for choices between different ends. In short, that even when rendered invisible, money can serve as a neutral mirror of a preexisting set of "real" possibilities and trade-offs. What was perhaps distinct to this late twentieth-century moment, along with the elevation of the rational (or more precisely, economic-model-consistent) expectations of market participants, was the faith that central banks were already implementing such an ideal rule.

Woodford himself was quite explicit that his intervention was intended merely to formalize the existing consensus—to backfill a consistent theory behind an inchoate set of practices that had evolved through trial and error. After praising the "new monetary rules" followed by contemporary central banks, he explained that the goal of his own work was "to provide theoretical foundations for a rule-based approach to monetary policy of this kind."[5]

Behind this deference to central bankers lay a particular set of theoretical commitments. First, the trajectory of the economy was determined by factors other than money. To put it in terms familiar to students of economics: Money was neutral, a veil over an underlying nonmonetary reality; money was unaffected by, and did not itself affect, the system that represented it. In the long term, money could not change economic dynamics.

Second, the central bank had complete control over the creation of money and could expand or contract the liquidity in the system by a careful manipulation of short-term interest rates; changes in the overnight interest rate set by the central bank would be directly transmitted to the terms on which agents throughout the economy could borrow or lend.

Third, the rules that defined the optimal monetary policy were objective and absolute, meaning they could be safely taken out of politics and handed over to a group of technical experts.

The financial crisis of 2007 upended this comfortable consensus. For the two of us, the aftermath of the Lehman collapse and the convulsions of the global macroeconomy marked a return to the interests that brought us to economics in the first place: a need to understand money and finance in a deeper way.

The years that followed saw an enormous upsurge in new approaches to money and monetary policy, including a resurrection of old debates. Alternative traditions, particularly those inspired by economists John Maynard Keynes, Karl Marx, and—in a rather different vein—Friedrich Hayek, appeared to offer a more robust vocabulary and better intellectual tools to make sense of the financial crisis and its aftermath than those of twenty-first-century economists. And because it was the heyday of the blogosphere (and the early days of Twitter), many of these debates found wide public audiences, pitting often-brilliant laypeople against elite economists on newly equal terms—a landscape that would have been hard to imagine a decade earlier.

The intellectual developments that flowed out of that period are fascinating, if also highly contested. The famed Bitcoin paper by the pseudonymous author Satoshi Nakamoto in 2008 resurrected age-old questions about the value of money, its proper role, and what properties define it.[6] Nearly two decades later, blockchains and cryptocurrency have become a ubiquitous feature of our lives, if of still doubtful real value.

On the other side of the political spectrum, some economists, including those of the Post Keynesian school, resurrected thinking about money as entirely an object of the state, something controlled and generated by the government. (This was not a new idea, but certainly a dormant one, though one well understood by scholars such as Jan Kregel, who preserved and disseminated these ideas for other economists in this century.) One particularly vigorous branch of Post Keynesian theory was what became identified as modern money (or monetary) theory. A group of scholars working decidedly out of the mainstream—Randall Wray, Stephanie Kelton, Pavlina Tcherneva, and Nathan Tankus and others—helped revive and popularize older Keynesian ideas, from Minsky and others, and

creating a genuine movement that attracted young people in universities worldwide. Old debates that had seemed obscure and scholastic—for example, about whether money was endogenous (i.e., generated by the financial system in response to demand for it) or exogenous (fixed externally, by the central bank or by the quantity of gold or other reserves)—resurfaced, with mainstream organizations such as the Bank of England and the International Monetary Fund (IMF) publishing formal reports in response. The nature and origins of money, and of central banks, with debates extending to the actual practice of how central banks issue money. At the same time, the scope of monetary policy expanded enormously, from targeting a single interest rate in the market for short-term government debt, to interventions in the markets for almost every asset imaginable.

For anyone entering the world of monetary economics after the financial crisis, this foment produced a whole host of frameworks—many of them disagreeing—to analyze money. Each starts from its own axioms, and those axioms can be diametrically opposed. From one set of perspectives, money is said to be a thing that exists in a definite quantity—ideally gold, but now bits on a computer; ensuring that the right amount of money exists is the only way to avoid a host of macroeconomic problems. From another, money is seen purely as a unit of account, a measurement like a meter or a year, so that the question of how much of it there is, is a category error, like asking how many inches there are in Europe. Some people emphasize the private creation of money by the banking system; some people (sometimes the same ones) insist that money is inherently public and always ultimately issued by the state. From one perspective central banks are seen as political institutions that are often the source of macroeconomic instability; from another, the rule followed by the central bank is a fundamental parameter of the economy just like the size of the labor force or the available production technology. The interest rate may be seen as a stand-in for immutable deep parameters like people's rate of time preference, or as a price set within the financial system, which can be modified to achieve our collective goals.

Thinking about money, in short, involves deep and difficult disagreements. Those disagreements extend all the way to the origins of money and its fundamental role in society.

This book is not a survey of those debates, let alone an attempt to resolve them. Rather, the book is an effort to foreground one particular source of

confusion, one so deep that it is almost invisible. That is, the conflation of money and things. At one level, it is obvious that that money is not the same thing as the physical and social objects it stands in for—so obvious as to not require stating. The payment for something is not the same as the thing itself. And yet, in many contexts, money payments are treated as equivalent to the thing they give claim to, both by economic theory and in our day-to-day language. A figure like GDP is the sum total of a set of money payments, but it is treated, almost universally, as a measure of the quantity of actual stuff that an economy has produced, or even as a sort of scorecard for the country where it happens. (The originators of purchasing power parity [PPP], the system used to compare GDP across countries, explicitly described their goal as a set of league tables "showing the comparative standing of various national economies.")[7] We speak of payments "to capital" or "to land" as if it were the things themselves receiving the income, and not the people who hold property rights over them. We talk about "real interest rates" or "real growth," as if adjusting for a price index changes the ontological relationship between two quantities of money.

The first step, then, is to mentally separate the world of payments and balance sheets from the world of concrete material and social objects—to learn to look *at* money, rather than trying to look through it. It's a way of seeing that takes concentration and practice, like one of those optical puzzles that seem to be a jumble of random shapes until, when you focus correctly, an image jumps out.

But that is only the first step. Once we conceptually distinguish money world from the concrete world of production, we must try to understand each of them on their own terms. If money quantities do not refer to some underlying physical quantity or value, what *do* they refer to? If the interest rate is not a reflection of the trade-off between the present and the past, where does it come from? If we cannot think of capital as a physical mass of tools, buildings, and other means of production, how should we think of it, and what does it mean to say that there is more of it in one time or place than another? If these payments and values and balance sheet entries don't describe any of the concrete objects around us, why are our lives organized as if they do? Why does it have a quantity? And why does it control so many aspects of our lives? Conversely, when we stop looking at the world through the lens of money, we can no longer think of it in terms of commensurable quantities and discrete property rights. So how do we think

about it? Is there a way of describing economic growth that doesn't implicitly depend on some homogeneous, material substance that corresponds to measures like GDP?

The collapsing of these two worlds, the worlds of money and of things, is built into the language we use to talk about the economy, so much so that we take it for granted. But as with many things that are taken for granted, it's worth looking at with a more critical eye.

What This Book Is About

This is the purpose of the book—to look at the relationship between money and things, the interface between these two worlds. John Maynard Keynes's great book is called *The General Theory of Employment, Interest, and Money*. We have sometimes joked to economist friends who asked us about this project over the years, that the subject of our book is the "and."

The book is an effort to connect these fundamental debates about the nature of money to contemporary historical and political questions. The title *Against Money* highlights the distinction between the network of money payments and values, on the one hand, and the social and material reality which exists apart from them and operates by quite different logics. In this sense, we mean "against" in the same way one might distinguish a figure *against* a background; by writing about money, we seek to clarify our vision of the social world that exists around, outside and in opposition to it. The title also announces our criticism of familiar ways of thinking, our challenge to the dominant view of money within economics. Finally, the title links the book to a political project that seeks to transcend markets and property rights as the organizing principles of economic life, and to imagine a future in which money no longer defines the scope and possibilities of our collective existence.

Money, we argue, is strange. It is not reducible to a shorthand for real, material qualities and activities; it is an autonomous, freestanding human activity. But that does not mean that it is disconnected or irrelevant. Quite the opposite. As we will see later, the idea that money is neutral—an economists' shibboleth—depends on the idea that there exist "real" values and quantities corresponding to the monetary ones. Once we see money as something distinct, we can also see it as an independent influence and actor on the material world. Money actively shapes our lives—as opposed to just reflecting it—in far-reaching ways. And taking this seriously gives one a different perspective on economics and the social world.

The questions we raise here are as old as the existence of money itself. In the last century, the nature of money and its relationship to economic life have had their most expansive and thorough consideration in the work of John Maynard Keynes, and much of this book draws on his work and uses

his language. We also draw on schools of thought going back to Karl Marx and Joseph Schumpeter (Hyman Minsky being the outstanding follower of the latter). The relationship between money world and the concrete social and material world is a long-standing, though not always explicit, question in the history of economic thought. A central strand in that history is the search for an answer that unifies these two worlds into one. And while the questions we are raising here are today rarely asked in the mainstream of economics, let alone in society, at some times in the past they have been more central.

Keynes, who did as much as anyone to move questions about money to the center of economic debates, described his perspective as the "monetary production" view, a vision of the economy "in which money plays a part of its own and affects motives and decisions . . . so that the course of events cannot be predicted, either in the long period or in the short, without a knowledge of the behavior of money."[8] Money affects production, and in doing so money also shapes—as opposed to just reflecting and facilitating—the economy. In this, Keynes echoed Marx, who saw a capitalist economy as organized around the self-expansion of value in the form of money.

In what follows, we apply this Keynesian monetary-production vision—as developed by contemporary writers like Perry Mehrling and our teacher Jim Crotty—to various domains of economic thought. Our argument in the book as a whole and in many of the individual chapters has three steps.

First, a negative claim: Money values do not reflect any real things or quantities already existing in the world. Debt is not simply a record of past consumption in excess of income; capital is not simply a mass of useful equipment and structures; the interest rate is not simply the price of stuff today in terms of stuff tomorrow. Imagining real, material objects as existing behind the money payments and prices leads to endless confusion and obfuscation; it is a habit we need to free ourselves from.

Second, there are useful stories about the history and development of what we call money world on its own terms, which we can tell once we free ourselves of the idea that is a passive reflection of the real. Interest rates cannot be usefully understood in terms of a trade-off between present and future, but they *can* be understood in terms of the desire for liquidity, and conventional pricing in asset markets. Sovereign debt crises do not reflect

the underlying soundness of a government's budget position; they reflect choices made by central banks.

Third, money's great role in our lives is as a coordination device. In its contradictory role as a social anonymizer and a social ledger, money creates new kinds of relationships between people. With its offshoots credit and capital, it actively transforms our collective activity in ways that are profoundly disruptive but also vastly expands our collective capabilities. To see this transformative role of money as a coordination device, we must first recognize the difference between the world of money and the social and material reality that lies outside it.

*

The first chapter of the book serves as a kind of overture. Here we contrast the monetary-production vision to what Keynes called the "real exchange" vision, which understands economic life in terms of the exchange of commodities, with money at best playing a secondary role. We then point to some paradoxical features of money that make it hard to think about systematically. Finally, we try to answer the always-critical question: Who cares? Why does this way of thinking about money matter for the substantive economic and political questions that people care about?

In the following section, comprising chapters 2 and 3, we begin with the kinds of real-world debates that brought us here. We discuss the two quantities that dominate our individual and collective balance sheets: debt and capital. These two central aggregates of money world are often understood to reflect "real," nonmonetary facts about the world—a mass of means of production in the case of capital, cumulated spending in excess of income in the case of debt. But the actual historical evolution of these aggregates cannot, we show, be understood in this way in either case. The evolution of capital as we observe it, in the form of wealth, is driven by changes in the value of existing claims on production, rather than the accumulation of new capital goods. These valuation changes in turn reflect, first, social factors influencing division of income between workers and owners and, second, financial factors influencing valuations of future income streams. Debt is related to borrowing, in a way that capital is not related to accumulation. But changes in indebtedness over time owe as much to interest, income, and price level changes that affect the burden of

existing debt stock as they do to new borrowing. And in any case borrowing mainly finances asset ownership, as opposed to the dissaving that the real-exchange vision imagines.

Chapters 4 and 5 discuss the interest rate, perhaps the central battleground between alternative perspectives on money and the pivot of money's role in the real economy. Because interest is a central fault line in debates about money, these chapters are necessarily more abstract and detailed. These two chapters, especially chapter 5, are more focused on the technicalities of the theory than the rest of the book, as they draw out both the mainstream and Keynesian approaches to the interest rate. Mainstream economic theory holds that the interest rate is the price of time, or saving—a price that could in principle exist in a world of pure barter. Thinking about the interest rate in this principle does not require any analysis of money or the financial system. There is, we argue, a basic incompatibility between this view of interest and the interest rate as it is observed in the real world, which is always a price of money (or more precisely, of one promise of money relative to another promise of money). Keynes offers two essential tools to think about this monetary interest rate: the ideas of liquidity and of convention. Once we see interest as a monetary price and determined within the financial system, we can see why money cannot be neutral—why financial conditions invariably influence both the level and the composition of real activity.

In chapter 6, we explore a long-debated question within economics: Are money prices and payments a reflection of some underlying "real" quantity? In particular we critically examine the concept of "real" GDP: Is there a quantity of output that exists independently of its measurement through money? Both economic theory and everyday language take it for granted that there is, but, as we show, this idea is more problematic than it at first appears. Rather, we suggest, the ubiquitous "real" quantities constructed by economists are at best phantom images of monetary quantities; at worst they are simply made up. Human productive activity and its products come in endless different forms. Particular physical quantities, like the number of bricks in a building, do exist. But there is no way to make a quantitative comparison between these heterogeneous things except on the basis of money prices—prices are not measuring any preexisting value. Prices within an exchange community are objective, from the point of view of those within the community. But there is no logically

consistent procedure for comparing “real” output once you leave boundaries of a given exchange community, whether across time or between countries. If we want to make comparisons about the level of development or well-being in different places and times, we conclude, we must stop chasing the will-o’-the-wisp of “real GDP” and focus on comparisons of material quantities that we can actually observe.

Finally, in chapter 7, we offer some tentative suggestions about where this perspective might lead. We ask what the world of production looks like once we no longer see it through the lens of money. And in a more speculative vein, we ask whether, after a long historical period in which money was central to massive social changes, is its role in organizing production diminishing? In the face of climate change, long-term planning, does the order of money remain functional? This, to us, is the most important goal of this inquiry—by seeing money itself more clearly, we may also be able to see a world beyond it.

Each of the chapters of this book makes a more or less self-contained argument. We hope that people will read the book in its entirety; we believe that the arguments of each section reinforce and complement those in other sections. But as teachers, we are well aware that not everyone can read this way, or wishes to; time is short, books are many, and not everyone reads for the same reasons or with the same interests. So we have tried to structure the book in such a way that an instructor could assign only those chapters relevant to their course, or so that someone who finds some parts of the book too detailed or technical, or simply not relevant, can skip to the chapters that seem more interesting to them, without too much disruption to the argument.

The book is as accessible and nontechnical as two economists could manage; we have not written it with our fellow economists in mind, though we hope at least a few of them will read it. There are almost no equations or charts. This is as much a book *about* economics as a book *of* economics. But we have tried to make this not *only* a book about economics, but a larger entry point to thinking about monetary production and the capitalist order.

We should also be clear, in apology or reassurance, that this is not a book about the details of contemporary financial markets. We are interested in the basic conceptual questions around money, and in situating contemporary

developments in relationship to old debates. There is no shortage of books on the structure of particular financial markets or the regulation of different financial institutions. This is not one of those books.

Finally, we must note an important omission. The real world contains not just money, but many moneys; some of the most analytically challenging and politically urgent questions involve how these different moneys interact. For the most part those questions are not discussed in this book. The dynamics of foreign exchange markets, the hierarchical character of the global financial system, and the ways that finance facilitates and constrains economic development would have been natural topics for this inquiry. But we struggled enough with the role of money in a single economy. We should also apologize for the disproportionate number of examples drawn from the United States. This reflects our own backgrounds and where we have worked these ideas out. We are well aware that history has played out differently elsewhere. With luck, we may return to these questions in the future with a more global perspective.

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The endless controversies over money—its nature, its function, what should be included under the term—are the result of the genuinely difficult problems it poses. We freely admit that we continue to struggle with many of these problems; whatever answers we give are only preliminary. Our goal, therefore, is less to convince the reader of the correct views on these various questions, as to establish that they *are* questions.

We once had the opportunity to talk with the great Keynesian economist Axel Leijonhufvud about the obligations of scholarship. He told us, “You must stick with the questions that are interesting to you, which means, I think, that you don’t write about things that you understand perfectly. You write on things where you’re trying to straighten yourself out.”

This book is a record of fifteen years of trying to straighten ourselves out. It is written, in some sense, for younger versions of ourselves, people coming to economics and politics from a critical standpoint, not fully understanding money, but having a sense of its importance. In many instances, people from such backgrounds are naturally suspicious of money, and seek to find grounding in other aspects of capitalism. This, we have

come to believe, is a mistake and a lost opportunity. If we are somewhat didactic in our approach, it is for this reason.

In various articles and blog posts and lectures over the years, we have explored some of these strands. This book seeks to bring them together. We may not have untied all the knots in our thinking, but we believe that the vision that we develop in this book is a rediscovery and reopening of an overgrown pathway that, we hope, fellow travelers will further explore. The chapters are also long, and although we have tried to make each section self-contained, each one probably explores too many topics that, with their snarls and twists, we have never fully resolved. But in laying out these threads we are trying to sketch out a different way of imagining the world. We hope it helps both in understanding the world, and in changing it.

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1

Does Money Matter?

Starting from the Real

On a cold and wet October day several years ago, when we were first thinking about this book, we were on our way to a hole-in-the-wall Japanese curry house on a side street in New York's East Village. As we were ducking inside, we noticed a hand-drawn flyer advertising an offer to barter French and Italian lessons and lessons in Renaissance-style drafting for some help with computers and cell phones. The exchange desired was quite specific—this was to be a simple swapping of skills by people of presumably very different backgrounds and interests. The flyer is reproduced as the frontispiece of this book.

To most observers, this might be a mildly amusing artifact from twenty-first-century New York. Depending on your perspective, it might be a sad attempt to recapture the East Village's long-lost spirit as a bohemian enclave, or else an encouraging reminder that Manhattan is not yet entirely a playground for the global rich. What it would *not* be is a typical example of an economic transaction. The direct exchange of goods is a rare exception in our world, a deliberate resistance of the normal way we organize productive activity. The economy—anywhere, let alone here in the global center of finance and trade—is organized through money. Everything around us—all the buildings, everything that happens inside them—is the way it is so that someone can get paid. Even the ground where we were standing that day was created for money—the Lower East Side, like much of Manhattan, is largely landfill. The extension of the island for profit goes back to the colonial era, when the sale of "water lots" below the high tide line for private development was the main source of revenue for the city government.[1]

It is a puzzle, then, to realize that both the discipline of economics and much of our everyday language about the economy regards this all-

consuming pursuit of money as no different from the exchange of painting lessons for computer help. The anonymous advertiser and their proposed exchange are imagined as typical—the standard model for economic transactions of all kinds. For the well-trained economist, all transactions, when reduced to their basic elements, are actually a form of barter. The existence of money is a convenience but makes no important difference. As the most famous economics textbook writer of the last century put it: "If we strip exchange down to its barest essentials and peel off the obscuring layer of money, we find that trade between individuals or nations largely boils down to barter."[2]

Strange as it may seem to a noneconomist, the fundamental irrelevance of money is a central throughline and tenet in orthodox economics. In his 1752 essay "Of Money," David Hume wrote that "money is nothing but the representation of labour and commodities, and serves only as a method of rating or estimating them. Where coin is in greater plenty; as a greater quantity of it is required to represent the same quantity of goods; it can have no effect, either good or bad."[3] In a speech some 250 years later Laurence Meyer, then a member of the Federal Reserve's Board of Governors, expressed the modern consensus in strikingly similar language: "Monetary policy cannot influence real variables—such as output and employment. . . . This is often referred to as the principle of the neutrality of money."[4]

Most economists in between would have agreed—with some important exceptions, discussed in various points in this book.

In an introductory economics class, money can be dispensed with in the first few lessons and then never brought up again: Its role in trade is merely a "veil" over a nonmonetary economy, in the metaphor made famous by the early twentieth-century economist Arthur Pigou and later in the century by Milton Friedman. Money has no independent existence; it is merely a stand-in for the exchangeability that is an inherent property of all the objects around us. An interest in money in itself is a category error, an "illusion" of which an economics education should disabuse you.

What is fundamental is barter and exchange. Lionel Robbins offered perhaps the best-known definition of economics a century ago: It is the study of "human behaviour as a relationship between ends and scarce means which have alternative uses."[5] Both the ends and the means are natural, physical facts. From Adam Smith and David Ricardo onward, a

central goal of economic theory has been to reduce the appearance of money values to a more fundamental physical quantity—to labor, by economists from Ricardo through Marx; to utility, since the "marginalist revolution" of the late nineteenth century.

In his comprehensive history of economic thought from the ancient world up to the early twentieth century, Joseph Schumpeter writes that most economic thinking about money starts from "the principle that all the essential phenomena of economic life [can be] described in terms of goods and services. . . . Money enters the picture only in the modest role of a technical device . . . to facilitate transactions. . . . So long as it functions normally, it does not affect the economic process, which behaves the same way as it would in a barter economy."[6] This device can break down in various ways, at which point the specific features of money and credit can become very important. But for big-picture questions about the economy, we can safely ignore them.

This vision depends both on the irrelevance or "neutrality" of money, at least in normal times, and on the goods to be exchanged—Robbins's scarce means—already existing in a known fixed quantity. Following John Maynard Keynes we call this the "real exchange" view of the economy. The alternative is the "monetary production" view developed in the heterodox traditions building on Marx and Keynes.

The late anthropologist David Graeber locates the origin of the real-exchange view in the ur-text of the discipline, Adam Smith's *Wealth of Nations*.[7] Here the starting point of economics is the human "propensity to truck, barter and exchange." Both the division of the world into distinct commodities that can be owned and traded and the organization of economic life through the exchange of equivalents are presented as natural facts, axioms from which economic analysis should start. First the fisherman trades fish for the trapper's furs; the mediation of this exchange by money comes later, both logically and historically, and doesn't change its fundamental nature. Though the history of economic thought contains plenty of countercurrents, this fundamental perspective continues to dominate today, in journals, at conferences, and in the classroom.

As Graeber argues, there is no reason to think that such nonmonetary exchange has ever existed. Barter is the projection of a monetary economy onto an imagined nonmonetary one; where it exists in reality, it's because

people accustomed to money are somehow deprived of it and have to work out a substitute, as in prisoner of war camps, or Russia under the grip of shock therapy. Even in societies where money is widely used for recording and settling some kinds of obligations, the organization of production and distribution of its products need not be through market exchange. Both logically and historically, money comes before trade, not after.

To be fair, Graeber is not the first one to notice this; it's been pointed out by many dissenters within the economics profession. Already a century ago, Allyn Young—obscure today, but a central figure in an older American tradition of monetary economics—could denounce "the habit of writers on the subject of money to picture an imaginary stage of barter which continued for a long period before it became possible to agree to use one particular commodity as the medium of exchange or measure of value."[8] The British economist Alfred Mitchell-Innes made similar arguments around the same time, which seem to have had an important influence on John Maynard Keynes's thinking.[9] (Mitchell-Innes was largely forgotten for the past century, though interest in him has recently seen something of a revival.) But for most economists, the "imaginary stage" of barter remains the basic template for their vision of the economy. Money exists, but—this is part of the universal textbook catechism—it is *neutral*. All the important economic outcomes—growth, employment, interest rate, international trade—can be worked out for a nonmonetary economy, from which money can cause at most transitory deviations.

People who have not been subjected to an economics education are less likely to think that money doesn't matter. But much of our everyday language about the economy still implicitly assumes that money is the superficial appearance of a deeper nonmonetary reality. A statistic like gross domestic product is understood to mean a quantity of stuff, which just happens to be measured in dollars; the idea that we can calculate the "real" output of a country, independent of its money value, is accepted by almost everyone who thinks about economic statistics at all.

Debt and other balance sheet items, similarly, are understood to reflect real choices in the past about consumption and work; if you are in debt, it must be because you have consumed more than you have earned. Laypeople as well as economists hear about "capital flows" between nations and imagine useful machines physically moving from one country

to another. When Wall Street promotes itself as directing the country's savings to its most productive investments, many may wonder if it is doing the job well; fewer wonder if that is what it is doing at all. The idea that these money values and payments might not reflect any underlying reality, but refer only to themselves, is unfamiliar and unsettling. When circumstances force us to acknowledge that finance and money may have a generative force, it's a source of unease or revulsion.

Discomfort with financial innovations—from the introduction of paper banknotes in the seventeenth century to the growth of derivatives in the late twentieth century to the cryptocurrencies of today—is often expressed as fear that they have lost contact with the real, underlying value that money is supposed to represent. Opposition to fiat money that lacks the backing of some form of real wealth is a throughline of political debates around money. At the US Constitutional Convention, one delegate suggested that including the power to emit paper money "would be as alarming as the Mark of the Beast in Revelations."[10]

Financial wealth, in everyday language as well as the minds of economists, is simply the accumulation of savings. The financial position of a corporation should reflect the underlying soundness of its business, about which there is some fact of the matter before the books are drawn up. When financial markets suddenly turn against the assets of some "emerging economy," as happens often, leading to a sudden collapse of its currency, this is understood—by the business press but also often by the victims—as a harsh but fair judgment on the underlying "soundness" of the country's institutions.

When finance becomes an active force reshaping real activity, instead of passively reflecting it, that can seem threatening or simply nonsensical. The late great radical scholar Mike Davis begins *City of Quartz*, his classic history of Los Angeles, with a visit to the short-lived socialist community of Llano del Rio, where he runs into a couple of migrant laborers from El Salvador. "When I observed that they were settled in the ruins of a ciudad socialista, one of them asked whether 'the rich people had come with planes and bombed them out.' No, I explained, the colony's credit had failed. They looked baffled and changed the subject."[11] As well they might: bombs, unlike credit, are at least a legible expression of political power.

One suspects that many people who work in finance have doubts about the difference between what they do and what they imagine to be useful work. Even Michael Jensen, who in the 1980s did as much as anyone to advance the idea that corporations exist only to make payments to shareholders, is uncomfortable with the possibility that it is literally true. “Value, in the way I’ve defined it, is the score that shows up on the scoreboard,” he told an interviewer for *The New Yorker*. “It’s not the objective. It’s not the strategy. Your life can’t be just about you, or your life will be shit.”[12]

The goal of the game is to score points, but the score on the board is just a reflection of the activity down on the field—or at least it should be, if the scoreboard is working properly. If the scoreboard is changing for its own reasons, or if the scorekeeper is directing the plays, something has gone seriously wrong.

The Monetary Production View

The real-exchange view—the idea that money represents preexisting relations between material things—draws support both from economists’ preferred framework for thinking about the world as a system of idealized barter, and from a widely shared moral intuition about the proper relationship between money and our lives. But it is not the only way of thinking about the relationship between money and things.

The argument of this book is that money does matter, in three senses. First, it has effects on the economy and the broader society. How easy it is to acquire money shapes real activity of production and social existence in general. Second, it evolves independently—money quantities do not reflect developments in an underlying real world. And third, many economic quantities (and many with significant implications) are only meaningful in terms of money. Statistics like GDP and phenomena like the interest rate are not monetary representations or appearances of some underlying “real” object but exist only in terms of money.

The alternative to the real-exchange view of the economy is what we are calling the monetary-production view. Both terms are originally Keynes’s, and he and many of his successors—though not the mainstream

“Keynesians” of recent decades—continue to be the main representatives of the monetary-production view.

Keynes himself became increasingly dissatisfied with the economics he had been taught during the 1920s, in response to its manifest inadequacy to address the dislocations that followed World War I. By 1933, he had come to see that it was precisely the active role of money in real economies that made existing approaches inadequate:

> The main reason why the problem of crises is unsolved . . . is to be found in the lack of what might be termed a *monetary theory of production*. . . . An economy, which uses money but uses it merely as a neutral link between transactions in real things and real assets and does not allow it to enter into motives and decisions might be called . . . a *real exchange economy*. The theory which I desiderate would deal, in contradistinction to this, with an economy in which money plays a part of its own and affects motives and decisions and is, in short, one of the operative factors in the situation, so that the course of events cannot be predicted, either in the long period or in the short, without a knowledge of the behaviour of money. (original emphasis)[13]

An economy where people trade existing (or potentially existing) goods to meet their own needs is fundamentally different from the economy as Keynes perceived it, in which production is organized by means of money payments and commitments.

One way of looking at Keynes’s work is as an attempt to escape the conflation of money flows, on the one hand, with quantities of real social and physical things, and on the other with a quantity of well-being or happiness. Instead, it is an attempt to see money as something distinct. His project, in this sense, is uncompleted. Eighty years later, it is still a challenge to imagine our collective productive activity except in terms of the quantities of money that organize it.

The aspect of this division that Keynes probably spent the most time on was the interest rate. In the real-exchange vision, the interest rate is the price of saving—a reward for deferring consumption. In the monetary-production vision, the interest rate is the price of liquidity, that is, for the

ability to make payments. Liquidity is the property that distinguishes money-like assets from other kinds of assets.

As Hyman Minsky, perhaps Keynes's most important American successor, emphasized, this argument goes beyond the interest rate to the yields and prices of all kinds of assets.[14] Money is not and cannot be neutral, argues Minsky, because the price of assets relative to currently produced goods and services depends essentially on how easy it is to make money payments. The decision to acquire a long-lived asset—real or financial—is inseparable from the question of how it will be financed.

A second dimension of the monetary-production view, less stressed by Keynes but central for Minsky, is that contracts are written in terms of money—one side, if not both, of almost any binding agreement is a commitment to make a stipulated set of money payments. The point at which a stipulated money payment cannot be made is the point at which the transactor leaves the world of voluntary exchange and enters that of some more directly coercive arm of the state—debtors' prison in the old days, bankruptcy court today. The need to make these promised payments is what Minsky called the *survival constraint*, and he built much of his work around it.[15]

These ideas have been further developed by modern Post Keynesians, notably Perry Mehrling and his collaborators. The defining feature of Mehrling's perspective is to see modern finance as comprising two systems —money as payments (underlining the importance of settlement), and as a market making system (underlining the centrality of money in "real" activity).[16] This view differs from both orthodox economics and finance, by seeing that money is an active organizing principle of the economy. While orthodox economics focuses on commodity production and exchange and finance focuses on asset pricing, this perspective sees the world as a set of interlocking promises to pay, disciplined by settlement and prices as generated by the monetary system itself.

While this view has never been a majority one in the economics profession, we can find variations on it as far back as the history of economic thought goes. Alongside the central tradition of economics that sees the world in terms of a given quantity of material resources, there is an alternative perspective that sees money as central. This alternative does not, however, form a coherent tradition, but exists in the work of scattered

individuals, departing from the orthodoxy of their day in response to the specific problems of their time. It seems as if every generation of economists rediscovers these insights in a kind of Samizdat literature that identifies and describes an entirely different origin of and role for money in a capitalist economy.

Even for Keynes, whose followers are the main current heirs of the approach, the discovery of these ideas took till he was in his midforties. In the mid-1920s he became obsessed with the history of money ("The old currency has become an uncontrollable madness," Keynes wrote in November 1925).[17] His 1930 *A Treatise on Money* offered, in many ways, a richer and more sophisticated picture of the financial system than what is found in his later work.[18] But it accepted the basic conceptual framework in which financial arrangements did not have any particular importance for the real activities of production and distribution. When he came to revise the book in the early 1930s, it became clear to him that this separation was no longer tenable. In 1932, he ceased giving his lectures on the pure theory of money and replaced them with a new series on the monetary theory of production. If we want to put an exact date on the Keynesian revolution, this, arguably, is where it begins.[19]

Keynes was not the first to realize that many of the most urgent questions about capitalist economies cannot be answered if one abstracts away the existence of money. His contemporary Joseph Schumpeter similarly stressed that credit and finance are an "essential part" of the "working of the capitalist engine . . . without which the rest cannot be understood at all."[20] And both could draw on a long countertradition within economics that made money and credit active elements in the organization of production rather than just passive reflections of it.

These countercurrents stand outside the canon of economic thought not only because of their intellectual disagreements, but because of their association with unconventional monetary and credit policies. If real economic outcomes depend on money and credit, then it is natural to look for ways to manipulate money or credit to produce better outcomes—something that to respectable opinion has always looked like an effort to get something for nothing, if not outright fraud.

But even without those concerns, the idea of a money world sui generis is extremely discomfiting—even more so when it seems to organize so much

of our social reality.

Money's Paradoxes

As a technology of coordination, money requires four conditions for it to function. First, there must be a unit in which various social objects or interactions between people can be measured. Second, there must be some form of recordkeeping in which people's obligations are tracked in terms of that unit. Third, there must be some specific form of settlement by which these obligations can be extinguished; this might be a token, or a record in some particular ledger. And finally, there must be sufficient pressure to in fact settle obligations in this way. It is this last step that gives money its objective character.

These four conditions often imply what may seem like contradictions or at least opposing tendencies, which are the source of many of the conceptual difficulties around money. The fact that there is an abstract unit that tracks and records interactions does not tell us what that unit is: just a unit in the abstract, or a thing (gold, a token) representing the unit? Similarly, the fact that there must be recordkeeping does not resolve which social institution does or should do this tracking. Money payment extinguishes obligations at the moment of settlement, but money commitments create new kinds of obligations. Money must be objective to act as a standard of value, and scarce to exercise a claim on labor and its products, but it must be flexible to facilitate new activity and to keep tension with the concrete needs of society within acceptable limits. Money by its nature is paradoxical—it must often be two opposing things at the same time. Many fierce arguments in economics stem from seeing only one of two coexisting sides of it.

Money Is Both a Concrete Thing and an Abstract Measure

It's a staple of introductory economics textbooks that money is defined by its functions. There are canonically three or four of these, two of which we have just discussed. Money is a unit of account—the unit in which the prices of everything else are stated. It is a means of exchange—the thing for which everything else is traded. And it is a store of wealth—the form in which a general claim on other people's labor can be held when one doesn't

want to exercise it on any particular thing at the moment. Some writers will add a fourth function, means of payment—that is, settlement of debts.

This definition in terms of functions is very old, already current in the seventeenth century. Early writers on money often explained the use of precious metals as money in terms of their suitability to perform these three or four functions. They are uniform—an ounce of pure silver is identical to any other ounce of pure silver—which makes them suitable as a standard of value. They are easily subdivided, making them suitable for use in exchange. And they keep indefinitely without upkeep, without wear or waste, making them suitable as stores of value.

But as thoughtful students sometimes notice, the first of these functions is not like the others. When paid for a good, held as wealth, or used to settle a debt, money is a concrete thing, something with a particular identity located at a particular place. But as a universal unit of measurement, money is an abstract quantity, like a second or a meter. When you say that you use a dollar to make a payment of one dollar, the word “dollar” is evidently being used in two different ways.

The essential feature of money as an abstract system of measurement is, as with any system of measurement, that it is uniform. A foot is just a foot, not anyone’s foot in particular. But money in use is always a particular thing. In other forms of measurement, the unit as such is distinct from the tool being used to measure it. But money is different. To say that something has a value of one dollar means that someone will give a dollar for it. But while the value is an abstract quantity, the giving is always of a particular thing.

The priority of money as an abstract unit versus money as a concrete object is a central fault line in debates over the nature of money. Classical economists from Smith on—but also Marxists and others—start from production and exchange, with money just one (specialized) commodity among others. Many unorthodox thinkers—today, especially students of Keynes—argued against this that “an abstract money of account is logically anterior to money’s forms and functions,” in sociologist Geoffrey Ingham’s words.[21] Proselytes for new digital currencies, by contrast, tend to focus on money in its pure commodity version.

Most economists struggle to see both sides of this contradiction between money as measure and money as thing—that money is both the unit in

which payments are measured and the means of actually making them. Today's mainstream tends to think of money, when they think of it at all, as simply an arbitrary unit of "value," whatever that is. The economist John Cochrane, for instance, saw the early 2010s debates about whether Greece should leave the euro as equivalent to debating whether it should leave the metric system. In Cochrane's words: "A currency is simply a unit of value, as meters are units of length. If the Greeks had skimped on the olive oil in a liter bottle, that wouldn't threaten the metric system."[22] What he misses is that the single currency means that claims anywhere in the euro area can be settled by deposits anywhere in the area. In this sense, what defines the "euro system" is not the use of the abstract euro as a unit of account, but the equivalence of concrete euros as embodied in bank deposits anywhere in the zone.

In a fascinating speech, Claudio Borio, then with the Bank of International Settlements, described "the coincidence of the means of payment with the unit of account" as one of the essential features of a well-functioning monetary system.[23] This is another way of describing the paradox we've been discussing here: The unit of account is an abstract measure while settlement normally requires the transfer of some particular *thing*. But "coincidence" is a bit misleading. To make these two things coincide requires the ongoing operation of a vast social machinery.

Money Is Both Public and Private

Money, says Georg Simmel in an oft-quoted phrase, is "a claim upon society."[24] This statement captures a central truth about money, but one we can look at in two different ways. On the one hand, money is a claim upon society in general, rather than upon anyone in particular. In this sense, money is an anonymizer, erasing social relationships. But on the other hand, as a claim by a particular person, it implies some system for mapping natural people onto money claims, and a relationship to the authority who tracks and enforces them.

To say money is your claim against society, in other words, is to say that it is society's promise to you. But who is empowered to make promises on behalf of society? And how are the abstract values recorded on balance sheets mapped onto the real social world? How do we decide when a payment has been made and a debt settled?

One obvious answer to the first question is the state. A claim to speak on behalf of the community as a whole is, arguably, what sovereignty is. The idea that money is fundamentally a claim against the state has a long history in the form of chartalism, from Georg Friedrich Knapp (who coined the term) in the early twentieth century, down to modern money theory in the present.[25]

A problem for the chartalist view is that most modern money is not issued by sovereigns. Today, the ledgers that constitute money are kept by banks; historically a variety of institutions have performed this role. Modern credit money in important ways originated as an *escape* from sovereign authority.

Still, *someone* has to keep the records, and chartalists are not wrong to see affinity with other functions of the state. But this affinity is not a logical necessity, and there are countervailing pressures pushing the other way. The tension between centralized versus decentralized recordkeeping is a central theme in the history of monetary systems. To hold a claim "upon society" requires trusting someone to honor that claim. That could mean all the various people that you deal with frequently. Or it could mean a single overarching authority.

A great variety of recordkeeping arrangements have given concrete existence to money world in different human societies. One can imagine a range of possibilities: At one extreme, a single society-wide clearinghouse tracks everyone's assets and liabilities; at the other extreme, the clearing function is widely dispersed throughout society. Historically, we can find cases across this range.

A very early example is the records kept in temples of ancient Babylon. (Keynes was particularly fascinated by this example; he described the period leading up to the writing of *A Treatise on Money* as his period of "Babylonian madness.")[26] These were records, written on clay tablets, of various debts incurred and settled—both commercial debts and debts associated with political or religious duties, and with settlement of personal obligations of different sorts. The salient point about these, from the credit money point of view, is that while they were written in terms of a unit of account that might correspond to a quantity of silver or grain, there is no suggestion that these commodities actually changed hands in the course of the transactions being recorded. Rather, making an appropriate record at the

temple—or breaking it, in the case of a debt being canceled—was itself sufficient for settlement. In effect, the preexisting recordkeeping functions of the temple allowed it to function as a social ledger, with the uniform obligations owed to it generalized as a standard for other obligations of all kinds.

Since religious institutions have acted as social recordkeepers in many settings, it's a natural extension for them to become keepers of the monetary ledger as well. In a fascinating case study from sixteenth-century Friesland, Merijn Knibbe and Paul Borghaerts describe how the pastor Paul Upkes acted as the keeper of all kinds of financial records for his village; when he died in 1553, his estate included around one hundred financial contracts, recording debts incurred between third parties. Knibbe and Borghaerts describe the "'clearing book' which was used to enable mutual cancellation (based upon market prices) of such credit-debts—in this case, no money at all was involved with these monetary transactions. Aside from this 'trade' credit for groceries, shoes, the blacksmith and wages of local laborers there was however also a 'loanable funds' market where people borrowed larger amounts of money to buy land or . . . boats or other items used for their livelihood."[27] Coins seem to have been used very rarely, and never for transactions themselves, but only to eventually settle debts in those cases where no offsetting credit could be found. In a setting like this, making a payment would mean making a promise to the other party, to be recorded in the books kept by the pastor. In this case, we may reasonably say that the pastor's ledger itself is money.

In his book, *The Evolution of Central Banking*, Stefano Ugolini gives a wide range of examples of different institutional paths toward our modern bank-based system of payment and settlement.[28] Even where the institutions involved are something that can reasonably be described as banks, there is a great deal of variation in the functions that develop first, the process by which others accrete around them, and where they fall on the continuum between private and public.

In Venice, for example, where payment by transfers of bank deposits developed much earlier than elsewhere in Europe, the city government increased its involvement only slowly and reluctantly in response to frequent bank crises and failures. By the late fourteenth century, while the banks themselves were still private businesses, "the financial district of the

city, was entirely owned by the state. The very benches on which transfer banks were allowed to operate belonged to the city and were only rented to them. For safekeeping purposes, bankers were allowed to make use of the coffers of the Treasury in the adjacent Palazzo dei Camerlenghi. Their books, moreover, were considered as public records . . . and were conserved for long even after they had gone out of business. This was due to the fact that Venetian law considered bank transfers as a legal way to discharge debt."[29] Officials in Venice strongly preferred to keep the payment systems private and only accepted the growing public role under duress. Discussion over these reforms in Renaissance Venice include some of the first explicit articulations of the trade-off between *stability* and *elasticity* that is a through line in debates about money.[30]

Another interesting case is the Kingdom of Naples, where a central bank evolved out of a system of charity pawnshops. In Naples, as elsewhere in Renaissance Italy, religious orders operated pawnshops as a charitable service for the poor. As with pawnshops everywhere, these kept records of who had borrowed against what security, either in their own books or in the form of redeemable tokens. These tokens could be transferred to third parties. You probably couldn't pay your landlord with your dining room table, for example, but you could pawn it and then give the landlord the ticket. In Naples, uniquely, the role of the pawnshops went a step beyond this; their claims became the usual means for settlement of large balances, were given legal tender status, and eventually became acceptable for payment of taxes.

The Naples case is interesting both for its similarities and its differences with other systems of proto-bank money. While some chartalists insist that money is always ultimately backed by the authority to tax, the Naples case is an example of why this is too strong a claim. In principle, any system of recordkeeping can be generalized into a payments system. The essential requirements are a set of numerical entries linked to identifiable social persons, their transferability to third parties, and the possibility of netting out offsetting entries. A great many different kinds of records can perform the function of money. Any record-keeper sufficiently central to the relevant social matrix can be enlisted as the holder of the social ledger. There is nothing unique about taxes.

History suggests that it is not necessarily the state that originates or maintains the social ledger, and that tax obligations are only one of many obligations that can be generalized as the model of all kinds of commitments. It is true that in some colonial settings, including the North American colonies that became the United States, tax liabilities have been the basis of a generalized payments system. But this is far from a universal pattern.

For neo-chartalists, it is the fact that the state accepts its own liabilities for tax payments that gives money value. One argument for this view is that while banks' liabilities are the means of payment for other private units, it is the government's liabilities (or strictly speaking the central bank's) that are used for payments between banks. There is some truth to this in contemporary practice. But it is not a necessary feature of the interbank payments system—historically, a few large banks often acted as clearinghouses for payments by other banks, and even today the Federal Reserve does not have a monopoly on US interbank payments, which may be routed through a private clearinghouse rather than through the Fed's SWIFT system. The evolution of the monetary system has followed several different paths historically; there is no reason to say the government's liabilities or taxing authority are *generally* prior to payments through private banks. In any case, the state's role in interbank payments does not create any quantitative link between anything on the government's balance sheet and the volume of bank lending.

Conversely, there is the line of reasoning favored by Austrian economists and those on the political Right, who view the existence of public money with suspicion. The ability of the state to create liabilities that function as general means of payment is bound to lead to monetary instability and inflation, since there is no check to it using this power to fund its own expenditures. The remedy is to support private money and to limit the ability of both private and public actors (though especially the latter) from expanding their liabilities without offsetting "hard" assets (exactly what this means varies). Older institutional forms such as free banking of the nineteenth century and modern innovations such as cryptocurrency draw from these deeply held misgivings.

If money is, at its root, a system for recording obligations and their fulfillment in a uniform standard, then we need to think carefully about who

is keeping the records, and what forms of social authority this recordkeeping is linked to.

Money Generates Relationships and Also Ends Them

As we have emphasized, money is a social coordination mechanism. It's a way of enabling people to cooperate, to act in unison toward some goal. I have some purpose in mind; my payment to you—whether as payment for a commodity or wage for your labor—is a signal to you to act in accord with that purpose.

What stands out about money as a coordination device, from this point of view, is its anonymity. Most coordination mechanisms are embedded in some ongoing relationship. We work together on some particular thing because of who we are—family members, boss and employee, members of a community of some kind. The kinds of instructions I can give you depend, in most settings, on who specifically we are in relation to each other. A teacher gives one set of commands to a student; a doctor gives one set of commands to a patient; an officer gives one set of commands to a soldier. To say that something is a commodity is, by contrast, to describe a command that anyone can give if they present the appropriate token.

One way of looking at money payments is that they substitute a generic obligation for a particular one. When I pay you for something of value, you don't receive some definite thing in return, but a promise of some unspecified thing at a later date. You get, not a claim upon me, but—as Simmel says—a claim upon society in general. Money, from this point of view, is a social device for making promises to strangers that enables forms of cooperation that would not otherwise be possible.

It's not for nothing that many classic accounts of the origins of the money focus on its role in long-distance trade—exchange outside of one's own community. Aristotle, for example, describes money as necessary for long-distance trade specifically.[31]

But it is not just a question of facilitating cooperation among people who don't initially have any relationship. Money can also be a powerful tool for canceling out relationships that already exist. When money is paid for something, all that matters is the amount; it doesn't matter who the transactors are, and there's no expectation of any future relationship

between them. In the same speech quoted earlier, Claudio Borio says, “A well-functioning monetary system . . . is a highly efficient means of ‘erasing’ any residual relationship between transacting parties: they can thus get on with their business without concerns about monitoring and managing what would be a long chain of counterparties (and counterparties of counterparties).”[32]

Or as David Graeber puts it, money payment is a way of settling outstanding obligations, in a way that leaves no further duties or expectations between the parties. (The radical anthropologist and international banker sound strikingly similar on this point.) A lawyers’ term for this feature of money is *privity*. This is the quality of a bank deposit that “cuts off adverse claims, and abolishes the . . . history of the account. If my bank balance is $100 . . . there is nothing else to know about the balance.”[33] As a market participant, what I will do or give for a given amount of money does not depend on whose it is or where it came from.

Sometimes, this anonymity is what is wanted—one brief act of cooperation, with no further interest by either party in the other. But for this same reason, in cases where one does hope for or expect an ongoing relationship, a money payment can be a disturbing and even aggressive act. Graeber gives the example, taken from Margaret Atwood, of the naturalist Ernest Thompson Seton, who “had an odd bill presented to him on his twenty-first birthday. It was a record kept by his father of all the expenses connected with young Ernest’s childhood and youth, including the fee charged by the doctor for delivering him.”[34] Seton paid the bill, he reports, and then never spoke to his father again—the natural result of a settling of accounts.

Money Is Both Rigid and Flexible

The role of money in organizing productive activity among strangers requires it to be scarce—available only in limited amounts, on fixed terms. But it also requires it to be flexible, available in open-ended amounts on terms that are open to negotiation.

The scarcity of money is evident to anyone facing the immediate deadline of a looming car loan or mortgage repayment. The desperate scramble to obtain a certain amount of money by a deadline is a staple of

popular culture—one could write a long list of movies and novels organized around the need to settle a debt. These stories reflect all too many people's real experiences. At a certain point, bills must be settled, and obtaining means of settlement can be difficult. You may have to do all sorts of things you don't want to do. From the other side, it is precisely the scarcity of money that gives its possessors a claim on all the things that they want. The scarcity of money means that you may have to give up your car when you can't make the payments on it. It's thanks to that same scarcity that someone will give you a car in exchange for money in the first place.

But just as important is the moment of elasticity when new obligations are created. The mortgage or car loan payments that are due today are the result of an earlier transaction in which you acquired the title to a house or a car with nothing but a promise. The possibility of acquiring a claim on real productive resources is one of money's critical contributions to the dynamic, transformative character of industrial capitalism—it is what allows for the creation of new production processes and enterprises, which cannot finance themselves from their own not-yet-existent revenues. But equally critical is the moment of rigidity, when the enterprise can no longer operate on the basis of promises, and must satisfy their cash commitments out of their own cash flows. That is when we find out if the promises were well founded. Neither an absolutely rigid nor a perfectly elastic system would allow the quantitative growth and qualitative transformations of modern capitalism.

The flexibility afforded by the ability to promise money payments is inseparable from the rigidity imposed by the obligation to eventually make good the promise. The shifting balance between flexibility and rigidity is at the heart of money as a social technology. Both the development of economies over time and various positions within them show different degrees of elasticity in money payments.

Once you start thinking in these terms, you can see the shifting balance between monetary scarcity and elasticity all around you. On a trip on New York's F train, for instance, we were struck by the fact that the three ads immediately opposite us were all for what one might call liquidity services. On the left was an ad for "personal asset loans" from something called Borro: "With this necklace . . . I funded my first business," says a satisfied customer. Next to it was an ad from the subway itself, trumpeting the fact

that you can pay your fare with a phone or a credit card. And then there was one from AptDeco.com, a clearinghouse for used furniture sales, with the tagline “NYC is now your furniture store.” All three of these ads are not for a commodity—a good or service desired for its own sake—but for the facilitation of transactions, that is, for liquidity.

The shifting balance between rigidity and elasticity, as illustrated by these ads, is an important reason why money cannot be neutral. In the world of orthodox economic theory, goods trade directly for goods, and outcomes in the indefinite future can be contracted over as easily as things existing today. In this world, it is possible to speak about real material things independently of monetary commitments. In such a world, there would be no need for intermediaries to facilitate purchases of transit rides or sales of used furniture. These services are needed precisely because, in the real world, we cannot contract directly over the future. We can only contract over today’s promises about the future. Some promises will be trusted and accepted, others will not be. Which means that what exists depends on what can be financed.

The orthodox view is that the level of economic activity is determined by nonmonetary factors—resources, tastes, technology—and people simply hold money balances proportionate to this level of activity. In this view, a change in the money supply can’t make anyone better or worse off, at least in the long run, or change anything about the economy except the price level.

Just looking at these ads shows us why that can’t be true. All three of these ads are, in effect, inviting you to make a payment in a way that you couldn’t previously. Without the specialized intermediary services being hawked here, you couldn’t pay the startup costs of a business with a necklace, or pay for a subway ride with a promise to pay later, or pay for much of anything with a used couch. The liquidity these services provide has real benefits—otherwise, no one would buy it, and it wouldn’t be worth the cost of producing (or advertising). The idea—stated explicitly in the Borro ad—is that the liquidity they offer allows productive activity to take place that otherwise wouldn’t. The ability to turn a piece of jewelry or a car into cash allows people to use capacities that otherwise would go to waste.

Why It Matters That Money Matters

Paradoxes make people uncomfortable. They are unsettling, requiring us to hold contradictory impulses at the same time. It is no wonder then that throughout history, there have been attempts to “reform” money to be only one thing. Thus, the insistence that only gold is “real” money was a staple of economic orthodoxy for generations and still has not lost its appeal. The ideas that money should only be public (or private), or that money has no role in reshaping social outcomes and should only be a passive record of payments that have already taken place (hence 100 percent reserve banking) resurface in social life and politics periodically. But for money to perform its functions, these tensions must remain unresolved.

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What is at stake in this? Why are we so insistent that the monetary-production view is necessary to understand the economic world we live in? There are three reasons.

First, because the economic world, as it appears to us in modern capitalism, fundamentally consists of a web of nominal monetary values. Most economic questions are irreducibly monetary.

Wages, prices, interest rates, and GDP are typically denominated in dollars or some other currency and are recorded as such. A great deal of heavy intellectual machinery is deployed by modern economics to retrofit the concept and construct of a “real economy” from these data. The observed values are assumed to arise out of the grinding out of individual utility functions, market exchange, and technology, all of which are unobservable. Modern economics, bound as it is to the view that money is epiphenomenal, must attempt to explain money values as arising from a deeper essence. Thus, we have constructs such as the natural interest rate, the rate of time preference, and the constant utility price index, which are supposed to be the bedrock “true” parameters of society that money values are merely reflecting. The corollary to this is that nominal values cannot evolve without these parameters changing. But in fact, money quantities and prices often change on their own, independent of any underlying “real” values. To give a useful account of the evolution of interest rates, or capital or debt over time, requires taking money world seriously.

Second, focusing on the line between money and concrete social reality is essential to seeing the ways in which the former shapes the latter. It helps us understand what money is *for*.

"Finance is useless" is a radical political idea, and one we share—to a point. But the idea that "finance is useful" is perhaps even more radical and subversive. Because the problems that finance is supposed to solve are ones that mainstream economics doesn't even acknowledge exist. And once you recognize that these are problems—trust, coordination, uncertainty, resilience, flexibility—you arrive at a very different vision of "the economy" than you would get from mainstream theory or from everyday common sense.

The usefulness of finance implies that the economic problem is not, or not only, a scarcity of material resources. It is a problem of coordination, and trust—the fundamental economic problem that finance helps solve is getting people to cooperate. If connecting society's resources to the people who can make use of them is this difficult—if it's worth devoting this giant apparatus to—then we can be confident that in many cases we have failed to do it.

The third reason is that we see rethinking money as part of a political project. Our emphasis is also on the connections between money and the various forms of hierarchy and domination that structure the social world. The fact that productive activity is carried out with reference to monetary quantities—prices, profits, financing—that follow their own logic is not a "distortion" of some preexisting market logic; rather, it is what establishes and enforces the logic of markets in the first place. Markets are in many ways strange and disturbing institutions, violating most people's moral instincts; without the need to meet obligations to make money payments, we almost always find ways to organize our collective activity on principles other than market exchange. Even within the corporation—an institution created for the purpose of market production—nonmarket principles rule, and norms and claims get firmly established that only powerful financial pressures can dislodge.

Money world exerts its market-enforcing pressures everywhere. For human beings, money can be thought of as an implicit contract between them and society. Think of money as a kind of social scorecard. You did something good—made something somebody wanted, let somebody else

use something you own, went to work and did everything the boss told you? Good for you, you get a cookie. Or more precisely, you get a credit, in both senses, in the personal record kept for you at a bank. Now you want something for yourself? OK, but that is going to be subtracted from the running total of how much you've done for the rest for us.

A few years ago, people were very excited about China's social credit system, a sort of generalization of the "permanent record" we use to intimidate schoolchildren. And it does sound dystopian. Think about it: a number assigned to every person, adjusted based on somebody's judgment of your prosocial or antisocial behavior. If your number is too low, you can't get on a plane. If it's really low, you can't even get on a bus. Could you imagine a system like that in Europe or the United States or India or anywhere in the "Free World"?

Except that this system already exists. The number is called a bank account. The difference is simply that we have so naturalized the system that "how much money you have" seems like simply a fact about you, rather than a judgment imposed by society.

The monetary-production view, then, is an entry point to a broader vision of transforming the social and economic order.

Perhaps the anonymous advertiser on that East Village signpost was just a naïf who didn't realize that the invention of money meant that the mutual coincidence of wants was no longer a thing. It seems more likely, though—and certainly more appealing—that they were making a deliberate choice to forgo the anonymizing technology of money. Probably they, like many people, were hoping to avoid the oppressive conversion of their daily life into money equivalents, and to re-embed productive cooperation in a social relationship between people, rather than a network of payments between economic units. Probably also, they hoped to carry out their language lessons with the goal of teaching someone the language, rather than generating the largest possible flow of money.

From this point of view, the sign is not only a false picture of the economy we live in, but a real picture of a different kind of economy. Freed of the bonds of money, one can teach Spanish in the morning, wrangle computers in the afternoon, and perhaps write books in the evening. Just as important, we can carry out these activities as well as we can by their own standards, instead of by the different standards imposed by the logic of

money. Which suggests a final paradox: Thinking more carefully about money is a first step toward a world where we don’t have to think about it at all.

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Part 2

Money in History

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2
Debt

Life in societies where the capitalist mode of production has taken hold is organized through an immense web of money payments. Every person, every organization, every activity, every material object or social practice over which some sort of property claims can be exercised leads a double existence, as itself and as a node in this network of money flows and commitments.

In this and the next chapter, we have one major point to make (and it is one of the key points of this book). The network of money payments and promises is not simply a reflection of the world of material things. It is influenced by it, but it also evolves under its own logic and exerts an independent influence back onto the social world. Money world has its own history, which we can tell.

While this may seem obvious, it is not the way that economists (and the rest of us) usually think. In both scholarly and public discussions, monetary aggregates are normally understood to reflect real, underlying nonmonetary facts about the world. This is not merely an intellectual error; many important political decisions, with far-reaching consequences for people's lives, are based on a conflation of changing money quantities with underlying developments in the material world. Conversely, a clearer understanding of the relationship between monetary quantities and our concrete material lives can open space for different choices about how to organize our collective lives.

In this chapter and the following one, we will look at the two great aggregates that are central to the evolution of money world: capital and debt. In the case of both, we argue, treating monetary quantities as a window into an underlying nonmonetary reality fundamentally distorts our understanding of the historical record and political choices.

Investigating Debt

We came to these realizations almost by accident. About fifteen years ago, one of us (Josh) visited the other (Arjun) in Boston, on a break from graduate school. That evening, we got to talking about what was, at that time, one of the great political debates of the time: how to think about the long-term rise in household debt in the US.

This was the period of the worldwide financial crisis set off by the collapse of the US housing bubble, and the monetary dislocations that followed. The newly installed Obama administration responded, infamously, by protecting creditors, while overseeing a deeper recession than the country had experienced in many decades. At the same time, groups such as the Tea Party (on the right) and the Occupy movement (on the left) were appearing, animated by different forms of the same fundamental complaint—that the response to the crisis had unfairly upheld some monetary claims while extinguishing others.

Our investigation started from the fact that US household debt had been rising relative to incomes for over two decades by then. From the mid-1960s to the mid-1980s, household debt was quite stable at around 45 percent of GDP. (The picture is similar if we look at it as a percentage of household income instead.) But after 1983, debt ratios rose rapidly, peaking at around 100 percent of GDP in 2007–2009. After 2009 it declined almost as rapidly as it had risen, to 75 percent of GDP as of this writing in 2024.

The rise in household debt over the 1983–2007 period was almost invariably understood as a result of higher borrowing in this period, which in turn was attributed to some mix of increased preference for present over future consumption, financial innovation that made credit more accessible, and the housing bubble and its associated wealth effects. One story—particularly popular among analysts on the left—blamed rising household debt on increased income inequality. In this story, stagnant incomes at the bottom drove borrowing for essential needs, while increased inequality higher up the distribution led to greater borrowing to finance a status competition. From the Right, the narrative focused on profligate households, well-meaning but ultimately irresponsible lending, and cultural decline. What was not contested was that households had, for decades, been borrowing more than they could. The long-term rise in debt-income ratios

must, almost by definition, be the result of years of expenditure over and above income.

But as a matter of accounting, rising debt-income ratios do not necessarily imply more borrowing or less saving. Imagine a family with an income of $50,000 that owes debts totaling $25,000, so their debt-income ratio is 50 percent. Now suppose that a year later, we find their debt-income ratio has fallen to 40 percent. What could have caused this? The obvious answer is that they paid back $5,000, while their income was unchanged. This would be negative borrowing; assuming that the money would otherwise have been used for consumption, it is also increased saving. But there are other possibilities. If interest rates fell substantially the family might have refinanced their debt, reducing their interest payments over the year. This would allow them to pay down their debt without any reduction in consumption spending, and hence without any increase in saving. Alternatively, the change might have come from the denominator of the ratio rather than the numerator; if nominal income increased to $62,500, then the debt ratio would fall to 40 percent without any reduction or borrowing or increase in saving. This rise in income might be the result of members of the family finding better-paying jobs; or it might be that inflation was high in that year and everyone's nominal incomes increased. Finally, it could be that the family's creditors had agreed to write off $5,000 of their debt, perhaps because the family simply couldn't pay it. All we know for sure is that some combination of these factors—repayment, lower interest rates, inflation, rising real incomes and charge-offs—added up to the observed change in the debt-income ratio.

Once we framed the question this way, it was natural to ask how much of a role each of these factors played in historical shifts in household debt ratios. It took only a few hours with the data to disabuse us of the idea that rising debt was mainly a story of increased borrowing—whether due to inequality, profligacy, or anything else. As a matter of historical fact, US households had *not* been borrowing more, even as their debt burdens grew. Or more precisely, the period of increased borrowing was limited to the years between 2000 and 2005, and this was offset by historically low borrowing during the 1980s and early '90s. If we compare the full period of rising debt ratios after 1980 to the decades of stable debt ratios before them, *none* of the difference is explained by changes in borrowing behavior. It was the result, rather, of a combination of slower nominal income growth

and higher interest rates. Both of these could be traced to the "Volcker shock" of the early 1980s; while the Fed had quickly lowered interest rates once inflation came down, the interest rates on mortgages, auto loans, and credit card debt remained high for much longer.

In retrospect, this finding should not have been surprising. A similar story can be told about the greatest collapses in incomes and asset prices, the Great Depression of the 1930s. And was, by one of its most important contemporary observers.

Between 1929 and 1933, household debt burdens in the United States rose dramatically, from 25 percent of income to 35 percent. During the same period, nonfinancial corporations' debt rose from 50 percent to 80 percent of GDP.[1] Was this because families and businesses were borrowing more, perhaps to maintain spending in the face of falling incomes?

No, it was not. New borrowing was extremely low during these years; both businesses and households were paying off (or defaulting on) old obligations much faster than they were incurring new debt. In dollar terms, the total value of household debt fell by about 25 percent over four years—an extraordinarily rapid reduction. But nominal income fell even faster—by about 35 percent, due to both the collapse in real activity and the fall in prices. So while households reduced their debt quite substantially, the economically relevant measure of indebtedness—the ratio of debt to income—actually went up. Businesses, similarly, sharply reduced their borrowing, but nonetheless saw their debt *rise* as a fraction of GDP, which fell even more.

Irving Fisher, perhaps the best-known US economist of this period, made this perverse relationship between borrowing and debt the centerpiece of his classic account, "The Debt-Deflation Theory of Great Depressions."[2] The self-perpetuating character of the Depression, in his view, came precisely from the fact that individual efforts to reduce indebtedness could increase it in the aggregate. In response to the crisis, households and businesses tried to pay down their debt by reducing spending. But, Fisher argued (anticipating Keynes), this reduced the income of other households and businesses, so that aggregate debt-income ratios actually went up. (Bank failures also played an important part in the story.) If indebtedness simply reflected expenditure choices, the massive shift toward saving by the private sector in the 1930s should have reduced their debt burdens. That it

did not, is precisely due to the independent existence of debt as a monetary quantity.

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The violence of the Depression foregrounded the autonomy of the monetary system and its capacity to disrupt real activity both for economists and for policymakers and the public. It is much less recognized that similar dynamics play a big role in almost all major shifts in indebtedness, including what happened in the Great Recession.

For most people investigating the post-1980 rise in household indebtedness, the question of why debt-income ratios rose is the same as the question of why households chose to borrow more. But in fact, they are not the same question at all.

In our work, we found that housing-related borrowing did play an important role in the rise of debt during the housing boom period of 2000–2005. But this missed the most important factor: high interest rates, in combination with slower nominal income growth. For the full rise in debt in the twenty-five years after 1983, these other factors are the main story, while borrowing played only a secondary role. And even this role was limited to the housing boom of the 2000s; new borrowing played no role whatsoever in the quantitatively similar rise in debt ratios over the fifteen prior years. During the 1980s, new borrowing by households was *negative*; households in the aggregate paid more in debt service than they received in new loans. Yet household debt-income ratios rose by about 30 points in the 1980s and were essentially flat in the earlier period. Following the Volcker shock of 1979–1982, interest rates facing households rose sharply, and remained high long after the federal funds rate fell. This, combined with lower inflation, led to a steep rise in household indebtedness despite a sharp reduction in borrowing. Something similar, and even more consequential, happened to sovereign borrowers leading to a “lost decade” of growth in much of the developing world.

Following our work that evening in Boston, we wrote and published several papers on this phenomenon. We termed the independent role played by income growth, interest rates, and defaults in the evolution of debt ratios “Fisher dynamics,” in a nod to Irving Fisher’s analysis of the Great Depression. Our point—straightforward but seldom acknowledged—was

that these forces are always operating. Faster income growth always reduces debt ratios, while higher interest rates always raise them, since in the aggregate debt is always being rolled over.

Why have economists of all stripes largely failed to take these factors into account? One possibility is the deeply rooted assumption that money is, in some sense, neutral—that it reflects real material activity. People are in debt because they have consumed more than their income; to reduce their debt, they must consume less. This vision is attractive to economists because it allows for analytically tractable models where debt is a device for shifting consumption over time. It is attractive to people in general because it fits a moral vision in which debt and saving are measures of responsibility, of the difference between those who are prudently living within their means and those who are wasteful and improvident.

Debt and Dissaving

In the moralizing language that pervades our economic life, owners of financial wealth are, definitionally, "savers," while debts are an obligation incurred from benefits received in the past. The explicit assumption of economists, implicitly shared in the everyday language, is that there is a straightforward equivalence between the stuff that was borrowed in the past and the stuff that is to be returned in the present. It is like lending a neighbor a household tool that they will later return. In the analogy of early twentieth-century economist Edwin Cannan—once a staple of textbooks—banks are like coat checks.[3] The tokens they issue are simply records of the real objects that have been deposited with them.

To orthodox economists, of our time as much as to Cannan, balance sheets are a passive record of the way that a given lifetime income has been shifted across time. Asset ownership is an indication that consumption, so far, has been less than income, while debt is a sign that consumption to date has exceeded income. The difference either way will inevitably be made up in subsequent periods.

To see the problems with this perspective, we need to clarify some terms. Saving, in economics, means the difference between income and consumption spending; it is thus a net measure, a summing-up of all of an economic unit's transactions. Debt and assets by contrast are gross

measures. How much you have of one can vary independently of how much you have of the other.

Dissaving is the opposite of saving, that is, total consumption spending over some period in excess of income over that period. This is different from borrowing in the sense of incurring new debt. “Savings,” a noun, is similarly ambiguous. While “saving,” the verb, describes the relationship between income and consumption, “savings,” the noun, describes the gross quantity of some type of asset. Saving more is one way to increase one’s savings, but it is not the only way. Someone who sells an asset and keeps the proceeds as a bank deposit or similar entity has certainly acquired more *savings*, but this transaction has no effect on their *saving* in an economic sense.

Saving and dissaving are part of income accounting; assets, debt, and borrowing in the sense of incurring new debt are part of balance sheet accounting. The failure to distinguish between these two sets of concepts is a great source of confusion in all kinds of discussions about the relationship between financial variables and real economic activity.

For example, there are fundamental accounting identities that apply to income concepts, but not to their balance sheet equivalents. Total income in the economy must equal total expenditure. So it is absolutely true that if some units in the economy are buying things worth more than their current income, some other units must be buying an equal amount less. But it is absolutely *not* true that the first set must be incurring debt, or that the second set must be accumulating an equal amount of assets.

Saving and dissaving in a macroeconomic sense are *net* flows—they are calculated by taking all current income, and subtracting from it all current spending (i.e., consumption for households, production costs and distributed profits for businesses, and essentially all public spending for governments). Borrowing in the sense of incurring new liabilities is a *gross* flow—how much debt a unit adds in a given period does not depend on what other changes are happening on the asset side.

Think about a person (or business or country) whose current expenditure exceeds their current income, and who sells assets equal to the gap, leaving their liabilities unchanged. This is unambiguously a case of *dissaving*, but is it also an example of borrowing? In the income-account sense it is, but in the balance sheet sense it is not.

If I take out a $250,000 loan and use the proceeds to pay for a house, my debt has, obviously, increased by $250,000. But that has no effect on my saving. My assets have also increased by $250,000, while my income and consumption are unchanged. If I additionally make a down payment, as homebuyers usually do, then my saving has increased even as I've incurred new debt.

In general, it is perfectly possible for a unit or sector's debt to increase, even though it is saving in a macroeconomic sense, or for its debt to decrease even though it is dissaving. In fact, since the main purpose of debt in modern economies is to finance assets, these "perverse" outcomes are more common than not.

These facts, obvious as they may seem, are obscured by models in which the main or sole purpose of debt is to finance consumption rather than asset ownership. In the life-cycle borrowing models found in textbooks, a household should have either assets or debt. Those who have (so far in their lives) been net savers should have assets, while those who have been net borrowers should have debt. But in reality, it's the other way around: The households with the most debt are by and large the same ones that have the most assets. The reason for this is, again, that the main function of debt, for both households and businesses, is to finance asset ownership. Similarly, higher-income households tend to be more indebted than lower-income ones. In the US, the debt-income ratio is highest for households around the 90th percentile of income, while most households with income in the bottom 10 percent have no debt at all.

In addition to financing current expenditure and asset positions, debt can also be incurred to finance the service of existing debt. This is obviously the case for sovereign governments, which normally roll over their debt as it comes due. (Large corporations, which issue bonds to achieve a desired capital structure rather than to finance anything in particular, often do the same.) It is not the case for individual households and smaller businesses. But it is the case for them as sectors—as some families are paying off their mortgages, others are signing new ones. This means that changes in debt can be driven by the costs of servicing existing debt, as opposed to expenditure and income in the present. This factor is quite important historically, as we noted before with respect to household debt. One might

think of the interest rate as a variable that is constantly shifting the relative balance between debtors and creditors.

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A striking historical example of this disconnect between saving and dissaving, on the one hand, and changes in debt, on the other, is the sharp rise in US municipal debt during the 1980s. In 1982, state and local government debt stood at around 11 percent of GDP, the same ratio as in the mid-1950s. But by 1987, it had risen to a then-historic high of 15 percent of GDP. This is smaller in absolute terms than the rise in household debt we discussed earlier, but it was quite large in historical terms and relative to these governments' budgets.[4]

One might expect that this sharp rise in municipal debt reflected an increase in expenditure by these governments—dissaving in the macroeconomic sense. Perhaps there was an expansion of public services, or a decline in the tax base, or cuts to revenue sharing from the central government? But in fact, none of these was the culprit. Nor was the rise in interest rates during this period. Rather, the rise in municipal debt burdens appears to have been primarily the result of the shift from pay-as-you-go to funded public pensions.[5]

For most of US history, pensions for retired public-sector employees were treated as a current expense, paid out of the same general budget as wages of active employees. During the 1980s, for a variety of legal and political reasons, state and local governments began shifting to a model in which an explicit fund was set aside to finance the future retirement benefits of current employees. Once established, contributions to and benefit payments from such a fund should roughly balance. But this is not so during the transition. Creating such a fund means adding substantial new spending on contributions, while existing retirees are still being paid out of current revenues. This was a major source of pressure on state and local governments in this period, which many of them responded to with increased borrowing.

The large rise in state and local debt during the 1980s was *not* associated with dissaving in the macroeconomic sense—that is, fiscal deficits—but rather with the accumulation of correspondingly large asset positions. In

fact, during this period the states whose public debt increased the most tended to be the ones that had the largest fiscal surpluses—a vivid illustration of the mismatch between *net* saving and borrowing and changes in *gross* debt.

We can sum up the point with a simple equation:

$$\text{income} - \text{expenditure} = \text{net asset acquisition} - \text{new borrowing}.$$

If we assume that a given economic unit is either accumulating assets *or* incurring debt, then that flow must reflect the balance between income and expenditure. If we further ignore nonconsumption spending like interest payments, then the addition to assets or debt will be equal to saving or dissaving, as the case may be. But if a unit may be both incurring or paying off debt *and* acquiring or selling assets, as is normally the case in reality, then these flows can vary independently, regardless of what is happening on the income side.

There is another lesson from the municipal debt story. How some pattern of expected future payments gets recorded on balance sheets is, while not exactly arbitrary, a question where quite different answers are reasonably possible. But once the choice is made, the way that future income and payments are recorded on the balance sheet has real repercussions for substantive outcomes.

In the short run, the shift to treating future retirement benefits as present liabilities created substantial fiscal pressure on state and local governments. In the long run, even if payments to and from the pensions funds balanced on average, prefunding made state and local governments sensitive to financial conditions in a way that they were not before, since any difference between the returns on the fund and the benefits due to retirees flow back to the sponsoring government’s budget, for better or worse. Vulnerability to financial markets is a very obvious danger of a large debt position. But it can also be a danger of linking real activity (like the compensation of public employees) to one’s position as an asset owner.

Pain Is the Agenda: Sovereign Debt and the Euro Crisis

If the household debt analysis was our intellectual starting point, the austerity crisis from 2010 offered us a bitter example of the political relevance of this view. There was a short interregnum in Europe and the US where, it seemed, political space had opened up for more egalitarian approaches to economic management—with movements like Occupy in the US gaining ground and parties like Greece's Syriza coming into power in Europe. What followed was a crash course in where real power lay.

We have seen that cash flows and balance sheet positions are not simply records of underlying real activity. They also constrain and direct that activity in ways that have profound effects on the evolution of economies and social life. Nowhere has this been more true and more destructive than in the case of the European sovereign debt crisis of the early 2010s and the ensuing decade of austerity.

The European Union has been among the most ambitious political experiments in the later twentieth century. As an attempt at supranational cooperation, it sits awkwardly between the world of independent nation states and a true unitary political entity. Since 1957, European treaties have aimed at deepening integration in a region that has been violently fissiparous in the past. A series of complex negotiations has led to the incomplete and uneven pooling of traditional sovereign powers. Unlike other international agreements, which are strictly external to the states party to them, the EU substantially replaces the exercise of national authority in a wide range of areas yet falls short of complete political federation.

For its fifty years, the project seemed, with some lurches, to be marching inexorably forward toward "ever greater union." But this came to a halt in the second decade of this century. The euro crisis is conventionally dated to 2009, and the discovery that Greek fiscal deficits were significantly larger than had been acknowledged. Given their shared currency and central bank, the debt of various euro-area governments had, until then, been considered almost equivalent. Now, investors fled from the debt of Greece; the spread between Greek and German bonds rose sharply, reaching an unprecedented 33 percentage points.[6] But the pressures did not stop there. Interest rates for a number of other peripheral European countries—including Portugal, Italy,

Ireland, and Spain—began to rise sharply as well. The rising debt-GDP ratios in all of these countries were seen as a sign of fiscal irresponsibility on the part of their governments.

In the immediate aftermath of the financial crisis in 2008, European governments had responded with broadly Keynesian stimulus policies. But the rising debt ratios and interest rate spreads in much of Europe coincided with a movement toward austerity across the policy and intellectual space.

Austerity was presented as basic economic sense. If countries had overspent, it was time for them to tighten their belts. Even countries like the United Kingdom, which had more autonomy, used the episode to turn the screws on their own expenditure. There was a clear morality tale joined to orthodox thinking about money, perhaps most influentially in a number of papers by the late Harvard economist Alberto Alesina.[7]

The argument went like this: The reason that governments have high debt-GDP ratios is that they have had persistently large fiscal deficits. High debt ratios indicate weakening ability to service the debt; as the ratio rises, the chance of default becomes larger and bond markets lose confidence that the government will be able to meet its obligations. This confidence is the main determinant of the interest rate the government faces (or whether it can borrow at all). When a critical debt ratio is breached, austerity is inevitable; unless the fiscal balance moves significantly and sustainably toward surplus, there is no way that rational bond market participants will continue buying the country's debt. Once fiscal surpluses (or at least much smaller deficits) are achieved, markets will regain confidence in the country's debt and once again be willing to hold the country's debt at moderate interest rates, lowering borrowing costs for both government and private borrowers.

Alesina's version of this story went a bit further, arguing that markets would be more willing to believe that fiscal surpluses were sustainable if they were based on spending cuts rather than tax hikes, and that the effect on interest rates could be so large and rapid that spending cuts could lead to faster growth not just down the road, but immediately. This anti-Keynesian doctrine of "expansionary austerity" was not accepted by everyone. But respectable opinion broadly agreed on the rest of the story.

In fact, though, this story does not describe what happened at all. Greece was the only one of the affected countries to have been in clear violation of

the EU's budget norms prior to the crisis. And even there, what happened was very far from a story about rational bond markets objectively responding to a country's fiscal position.

On the eve of the crisis, Germany and France, which remained unscathed, had debt ratios well above those of Ireland and Spain and similar to those of Cyprus and Portugal. In fact, until 2011 Ireland had the lowest debt ratio of any major western European country. Fiscal deficits in the first decade of the euro, similarly, were consistently higher in France and Germany than in Spain or Ireland, and comparable to those in Cyprus and Italy.

This was *not*—with the partial exception of Greece—a story of governments running up unsustainable debts and the markets eventually turning against their debt, cutting off new borrowing until they got their fiscal houses in order.

Rather, the crisis in the financial markets came first; the rise in debt came afterward, and in large part because of it. Austerity was imposed by the political choices at the European Central Bank (ECB) rather than by anonymous bond vigilantes, and when the ECB changed course, borrowing costs fell across Europe, including in those countries where debt ratios remained very high.

As in the case of US household debt that we discussed at the start of the chapter, rising public debt ratios in Europe were primarily a product of high interest rates and slow growth, not increased spending. This was true even in Greece, the one country where both deficits and debt were high prior to the crisis. Between 2010 and 2015, sweeping cutbacks in public services successfully shifted the fiscal balance 12 points toward surplus, and reduced public debt by about €15 billion, or 5 percent of 2010 GDP—a truly massive shift. But the debt-GDP ratio still rose by an even more massive 30 percentage points, thanks to a collapse in output. The same goes even more for the other countries. Spain, for instance, was running fiscal surpluses in the mid-2000s, and had a debt-GDP ratio less than half that of France or Germany. The sharp rise in fiscal deficits and the debt ratio there was entirely the result of the financial crisis. High interest rates were the cause of rising debt ratios, rather than the result of them.

While these dynamics were especially dramatic, and destructive, during the euro crisis, they are in no way unique to it. In other periods, large

reductions in debt ratios have been driven by a combination of low interest rates and rapid nominal growth, without any need for austerity. According to one IMF study of the large falls in debt ratios in the decades after World War II, growth rates in excess of interest rates contributed four times as much as fiscal surpluses did.[8]

Ireland in the 1990s offers a particularly dramatic example. There the debt-GDP ratio fell by 20 points in just five years, even while the state engaged in major new debt-financed expenditure, thanks to the combination of relatively low interest rates and the very high growth rates of the "Celtic Tiger" period. These dynamics are more important when the debt ratio is higher. When debt is already large relative to GDP, even moderately slower growth or higher interest rates can easily raise the debt ratio faster than even very large surpluses can reduce it—as was the case in Greece. In this sense, the case for austerity gets weaker, not stronger, when debt is very high.

The pro-austerity narrative relies on the assumption that bond markets accurately assess the fiscal position and make their decisions based on that; rising interest rates are the channel by which high debt creates pressure for austerity, while falling interest rates are the channel by which austerity supports renewed growth. One problem, as we've noted, is that the big rise in deficits and debt ratios followed, rather than preceded, the spike in interest rates; several of the countries that saw steeply rising spreads in 2010–2011 were models of fiscal probity before the crisis. There is another, more basic problem with this view. The financial institutions that were now terrified of holding Spanish, Portuguese, Irish, or Greek bonds were the very same ones that had gobbled up their public and private debt at rock-bottom rates just a few years before. And these are the same markets that are setting interest rates for those countries at historical low levels today. Countries like Greece paid less to borrow than the US by 2019, even as their debt ratios, in many cases, remain extremely high—more than 200 percent of GDP in the case of Greece.

Ireland is sometimes pointed to as an austerity success story; after reducing its debt ratio by 50 points between 2010 and 2019, it was able to borrow at less than 1 percent. Inconveniently for this story, however, Spain was borrowing just as cheaply, even though its debt ratio had risen by 40 points over the same period.[9]

The standard orthodox view wanted to insist both that postcrisis interest rates reflect the true state of public finances, and that the low rates before the crisis were the result of a speculative bubble. But if low rates in 2005 were not a clear sign that the state of public finances was sound in the overall periphery, then high rates in 2010 could not have been a clear sign that they were shaky.

If the objective state of government finances did not drive borrowing costs in Europe, what did? We will explore interest rates in depth in chapters 4 and 5. But the short answer is a combination of self-confirming beliefs in financial markets and the actions of the ECB.

A rise in interest rates is equivalent to a fall in bond prices. Investors do not want to hold a bond whose price is likely to fall, even if it will eventually be paid in full. So for bond prices to fall, it's enough for investors to believe that they will fall, or to think that other investors believe that. The capacity for such self-confirming beliefs, or conventions, to keep interest rates far away from any "fundamental" level indefinitely, was one of Keynes's great insights.

If financial market conventions, rather than fiscal profligacy, drove borrowing costs up in peripheral Europe, it was the intervention of the ECB, rather than fiscal rectitude, that brought them back down.

The resolution to the crisis was purely monetary. At a speech in London in 2012, the ECB president, Mario Draghi confronted what seemed to be an existential crisis threatening the European Union as bond yields of the periphery kept rising. Draghi began his speech with an odd and mangled reference to the aerodynamic properties of bees: "So the euro was a bumblebee that flew very well for several years. And now—and I think people ask 'how come?'—probably there was something in the atmosphere, in the air, that made the bumblebee fly. Now something must have changed in the air, and we know what after the financial crisis. The bumblebee would have to graduate to a real bee."[10] He then simply said, "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough." The "whatever it takes" language referred to the mandate to buy bonds of the affected states directly through what were called outright monetary transactions—in effect simply creating euros and buying the affected bonds—something that the ECB had explicitly been prevented from doing beforehand.

This speech stopped the sharp spike in southern European interest rates in its tracks. It was not even necessary for the ECB to actually buy southern European debt. This is very much not a story of supply and demand: The conventional basis of bond pricing meant that the mere belief that the ECB would buy bonds, if necessary—and the knowledge that other market participants shared that belief—was enough to immediately reverse the rise in interest rates.

This was sufficient to resolve the crisis for some countries. And the corollary is also true—to the extent that governments like Greece remained locked out of bond markets after Draghi's announcement, this was a choice by the ECB.

By stepping in to stabilize government borrowing markets, the ECB was not simply addressing an immediate crisis. It was substituting its own conscious, political judgment about the appropriate state of government finances, for the supposed automatic reactions of bond markets.

Supporters of the ECB's actions were quite clear about this. Here for example is then–Bundesbank President Jens Weidmann: "Relieving stress in the sovereign bond markets eases imminent funding pain but blurs the signal to sovereigns about the precarious state of public finances and the urgent need to act. Macroeconomic imbalances and unsustainable public and private debt in some member states lie at the heart of the sovereign debt crisis. It may appeal to politicians to abstain from unpopular decisions and try to solve problems through monetary accommodation. However, it is up to monetary policymakers to fend off these pressures."[11] It is up to the ECB, in other words, to apply its own pressure on governments, to make up for the pressure from the bond markets that it has relieved.

What this pressure meant concretely was spelled out by a contemporary editorial in the *Financial Times* on the ECB's intervention to support the market for Italy's public debt: "Structural reform is the quid pro quo for the European Central Bank's purchases last week of Italian government bonds, an action that bought Italy breathing space by driving down yields. . . . Boosting Italy's growth prospects requires a liberalisation of rigid labour markets and a bracing dose of competition in the economy's sheltered service sectors. . . . Only if long overdue structural reforms take root will the pain be worthwhile."[12] The explicit mention of a quid pro quo is striking. In the editorialists' view, stabilizing the bond markets was not

simply the ECB's responsibility as a central bank, but something it could trade—a bargaining chip to offer in return for its own program of liberalization. Or as another letter writer in the *FT* put it: "The ECB appears to believe that in addition to price stability it has a mandate to impose structural reform. To this extent, cyclical pain is part of its agenda."[13]

The ECB had in fact required just such quid pro quos in its earlier interventions on behalf of troubled banking systems, under Draghi's predecessor Jean-Claude Trichet, although this did not become public until a few years later. (Because European finance "renationalized" during this period, with banks mostly holding their own government's bonds, the sovereign debt crises were closely linked to banking crises.) In letters to the governments of Italy, Spain, and Ireland, Trichet demanded a long list of structural reforms as a condition for support for their country's banks.[14] (This would soon be repeated in a more formalized way by the "Troika" in Greece.) These demands went well beyond the normal remit of a central bank. In Italy, the ECB demanded, among other things:

- "full liberalisation of local public services . . . [and] the provision of local services through large scale privatizations";
- "reform [of] the collective wage bargaining system . . . to tailor wages and working conditions to firms' specific needs";
- "thorough review of the rules regulating the hiring and dismissal of employees"; and
- an increase in the retirement age, and "making more stringent the eligibility criteria for . . . pensions."[15]

Choices about which services should be provided by the state and which privately, or regulation of wages and employment contracts, are normally considered among the core responsibilities of a democratic government, not something to be delegated to the technocrats at the central bank.

Under the gold standard, it is true, such choices might be made under pressure from financial markets—or more precisely, financial markets backed by the power of a stronger creditor. In the nineteenth century, once-powerful states like Egypt, Turkey, and China lost authority over core functions of government, or even sovereignty altogether, after being unable

to service foreign debts. Countries of the global South face similar pressure today (though imposed, usually, by the creditors' cartel as represented in the IMF, rather than by the gunboats of individual governments).

But developed countries don't expect to be subject to such constraints. Much of the architecture of international finance and trade—including the early stages of European integration—were established precisely in order to free democratic governments to manage their economies without the prior approval of bondholders. They were meant to allow countries to pursue full employment and social democracy, to create national or supranational spaces in which collective choice took priority over the logic of money.

The euro in this context looks like an effort to roll all that back and expand the sphere of life subject to the rule of money. It was, from this point of view, an effort to restore the logic of the gold standard, whose essential condition was that preservation of money claims had priority over democratic government. In which case crises are not a failure of the system but an essential part of its functioning, since discipline requires that punishment be sometimes visibly meted out.

This kind of perspective is typically found on the left, often with reference to Karl Polanyi. But it's clear that many of those on the side of the authorities were thinking this way too. According to Thomas Mayer, the former chief economist of Deutsche Bank, the goal of the euro "was to create . . . the modern equivalent of a gold standard. Monetary decisions would be made by the European Central Bank, whose only goal would be price stability. The lack of shared political institutions did not matter, because the ECB . . . would never lend to member states, even ones that were at risk of going bankrupt."[16] The problem, for Mayer, was that the ECB's decision to intervene in sovereign debt markets rather than risk the breakup of the euro meant that the threat of a crisis no longer had a disciplining effect. So Germany had been forced to build "a pan-European 'shadow state'—a web of pacts to ensure that countries followed policies consistent with sound money."

The same point was made in an "analytical note" released by then–European Commission President Jean-Claude Juncker: "The stabilising effect of the single currency has certain counterproductive effects with regard to the willingness to . . . implement the necessary structural reforms."[17] Wolfgang Schäuble, then the German finance minister and

leading figure of European monetary orthodoxy, was even blunter. During the confrontation with the Syriza government in Greece, he insisted that any further discounting, or writing off, of Greek debt was unacceptable—not for its direct costs, but because of the example that it would set for other European governments, including Italy and even France.[18] "If we go deeper into the discount debate," one of his officials warned, "there will be no more reforms in Europe. There will be joyful celebrations in the Elysée and probably in Rome, too, if we go down this path."[19] There is not even a pretense here that the goal is about resolving the crisis, as opposed to using the crisis as leverage to promote a particular policy agenda.

One can certainly quibble with these analyses. From our point of view, the euro system could never have operated like the gold standard, since the TARGET2 clearance system—integral to the whole project—gave each national central bank an unlimited line of credit with the others. In effect, making the euro a genuine single currency required the system to automatically make good any payment imbalances between countries. This meant that "market discipline" was always going to require the conscious action of the central bank. But on the politics of the crisis and its resolution, we should take people like Juncker and Schäuble very seriously. They, after all, were the ones who were in charge.

It is hard to exaggerate the consequences of this. The crisis-hit countries lost a full generation of economic growth, with incomes in Greece, Spain, and Italy no higher in 2024 than in 2008. An even larger consequence was the closing off of a sense of possibilities. The top-down revolution pushed through by the crisis gave a once-in-a-lifetime opportunity for elites to redraw the limits of political debate. This rolling back of European social democracy may turn out to be a major reversal of one of humanity's most impressive attempts to collectively take control of our material lives. Twenty years later the forces of reaction are stronger than ever, threatening the liberal elite itself.

The larger political trajectory of the EU is outside the scope of the book. The point for our purposes is that the space in which these choices were made was created by the weak articulation of financial developments with real activity. The authors of austerity in the eurozone got a great deal of rhetorical value from the idea that their actions simply reflected an objective judgment of markets.[20] The European Union, with its overlapping

authorities and obscure jurisdictional mazes, is particularly well suited for presenting political choices as just following the rules. But in reality, as those running things understood very well, there was no direct link between objective constraints and financial market outcomes. Which was precisely what made finance such a powerful weapon to achieve goals that could never have been achieved through democratic politics.

If financial conditions are not simply objective measures of creditworthiness, then they are something that someone, in principle, can make a choice about. And if that choice can be used to constrain political space as in Europe, it can also be used to expand it.

Credit as Gosplan

Finance is an independent locus of politics and power, as we argued in the previous section. But there is another side to this. That same indeterminacy is what gives credit its positive, creative role in organizing human activity. If credit contracts merely recognized already-existing future incomes and payments, as in the orthodox view, then it would be hard to see the social value in the enormous apparatus of finance. The genuine social value of finance comes from its ability to create new futures.

Credit, fundamentally, is a way of *creating space* between income and expenditure, allowing the latter to vary independently of the former. In effect, it substitutes the hopes of the borrower for the judgment of the market as reflected in income to date—provided those hopes are deemed plausible by a lender. It is for good reason that “credit” is etymologically linked to belief. What banks and similar institutions do, fundamentally, is assign a claim on the social product today based on a belief—a subjective judgment—that the recipient will use it to produce something of value.

The ability to exercise claims in the present based on beliefs about the future is essential to an economic system organized around constant transformations of the organization of production. The critical importance of credit for capitalist growth was particularly emphasized by Joseph Schumpeter. Schumpeter is well known for his ideas about innovation and entrepreneurship. What is not often remembered was how he saw these transformative processes as distinct from, and even opposed to, the equilibrating dynamics of markets. The transformation of production in

capitalist societies is often attributed, even by some socialists, to the idea that they are "market economies." But from a Schumpeterian standpoint innovation is fundamentally about *departure* from market logic. It is the substitution of conscious planning for the impersonal forces of supply and demand. The same goes on a national scale, for development and industrialization.

The relationship "between . . . credit creation by banks and innovation," Schumpeter writes, "is fundamental to the understanding of the capitalist engine." The way to understand this relationship, he suggests, is to think of it not in terms of any kind of market process, but rather as analogous to the economic planning agency of the then recently established Soviet Union.

> Since the central authority of the socialist state controls all existing means of production, all it has to do in case it decides to set up new production functions is simply to issue orders to those in charge of the productive functions to withdraw part of them from the employments in which they are engaged, and to apply [them] . . . to the new purposes. . . . We may think of a kind of Gosplan as an illustration. In capitalist society the means of production required must also be . . . directed into the new employments. . . . The issue to the entrepreneurs of new means of payments created ad hoc is . . . what corresponds in capitalist society to the order issued by the central bureau in the socialist state. . . . Banks, in providing entrepreneurs with means to buy factors of production or their services, do something akin to issuing such orders.[21]

The key points to note here are, first, that entrepreneurs' spending is normally financed by newly created funds, rather than from their own market income, and second, that these funds are allocated by the deliberate decisions of specialized agencies—a form of planning.

Schumpeter's great student Hyman Minsky was equally aware of the creative power of credit creation, and the impossibility of fitting it into a model of market equilibrium. Perhaps more than Schumpeter, he also emphasized the other side of credit, the accumulation of payment commitments that cannot always be met. Credit opens up new possibilities. Debt inherited from the past constrains them.

Minsky's political views—less well known than his analysis of finance—illustrate another important point about credit. If capitalism is constituted by an unstable tension between markets and planning, then opposition to existing capitalism can point toward either of those poles. As the economist Mike Beggs points out in a perceptive essay, Minsky first came to study economics because he was attracted to the market socialism of Oskar Lange, and for decades thereafter continued to support it.[22] Anyone with their eyes open can see that actual production under capitalism is organized by large, centralized organizations. But for market socialists like Lange, this was not a disproof of the idea that decentralized markets could efficiently organize production. It just required first clearing away the concentrations of wealth and power that had displaced market coordination. Or as Beggs puts it, "The happy results of welfare economics could be reached only in a socialist economy," which could be organized "*as if* perfect competition prevailed" (original emphasis).[23]

Industrial capitalism is already a substantially planned economy; as Karl Marx as well as Schumpeter emphasized, this is particularly true of the financial system. For most socialists this fact suggests the possibility of a relatively organic, even incremental transition to socialism; much of the existing system of conscious coordination could be subject to democratic control rather than rebuilt from scratch. But it is logically possible to read the contradiction between ideal and reality the opposite way, as with Lange and Minsky.

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Money, we suggest, can be thought of as a magic mirror, which like those in old fairy tales, shows something other than what is reflected in it, where images can change on their own, with real effects on whatever is depicted in them.

Money allows for obligations to be recorded in an abstract way, as an unspecified duty to or from society at large, rather than obligation by one particular person to do some specific thing for another particular person. And it allows qualitatively different objects to be compared quantitatively. (This property is shared with some magic mirrors in stories—as recorded by the Grimm Brothers, the wicked queen's mirror tells her that "Snow-White is a thousand times fairer than you."[24] If it had stuck with saying that they

were each beautiful in their own incommensurable ways, things might have turned out better.) But this abstraction involves the creation of new concrete objects and relationships. The idea of money may be to allow us to promise someone an abstract claim on the social product, rather than any particular thing. But once the promise is made, it takes on its own concrete existence as an obligation to deliver money—now some specific object rather than an abstract unit of measurement—to a particular creditor on a particular date.

At any given moment, a capitalist economy contains both collective productive activity organized through money payments—what we call the real economy—and a web of money commitments inherited from the past.

The ability to issue new liabilities is an essential source of flexibility. It allows the pattern of payments to depart from the incomes created by existing patterns of activity. This flexibility—the great social value created by money, is what Keynes called *liquidity*.

As we will discuss more in later chapters, Keynes's presentation of this concept in *The General Theory* is handicapped by his decision to focus exclusively on liquidity on the asset side of the balance sheet. In his presentation, the only source of liquidity is money that one already possesses. But much more important is the flexibility on the *liability* side—the ability to exercise a new claim or satisfy an old one, by making a promise. This is what allows people and projects whose activities have not, yet, been validated by money incomes to nonetheless to exercise claims on the social product via money payments. It is this capacity to ignore the judgment of the market—for a while—in favor of somebody's hopes or plans that gives capitalist production its dynamism. But it is also this web of promises that creates the constraints that past choices impose on present ones—a problem that *The General Theory*, for all its concern with the complex interplay between the past and the future, never really engages with. Strikingly, given the central place it occupies in both contemporary accounts of the Depression like Fisher's and ones by later Keynesians, the inherited web of nominal commitments plays no role in Keynes's account of capitalist instability.

For us, it is crucial. And it is crucial that this inherited web is not merely inherited, but is constantly being adjusted after the fact, becoming retroactively tighter or looser. What we call Fisher dynamics is simply a precise quantitative description of the ways in which the inherited web of

balance sheet commitments grows lighter or heavier relative to current income flows. Higher growth and inflation reduce the weight of past commitments relative to present activities; higher interest rates or deflation increase the weight of past commitments relative to the present.

The most obvious site of the tension between rigidity and elasticity is the banking system. Bank loans allow increased expenditure not just for the borrowing unit but for society as a whole. And banks' willingness to lend is a function of their subjective judgments of the project to be financed and the borrowers' creditworthiness, not any existing stock of resources. The greater or lesser willingness of banks to do this is one of the main ways in which the system shifts between greater elasticity and greater rigidity.

But it's not only banks that can stretch out the network of payments by creating money. Corporations create money when they issue stock to pay employees or make acquisitions. Silicon Valley is among the places where the monetary web is at its most elastic. But it is hardly unique—almost all transactions between businesses take place on the basis of trade credit, with suppliers billing on thirty-, sixty-, or ninety-day invoices. These invoices may then be sold to trade credit specialists, who finance them by issuing their own liabilities. Even routine purchases can thus involve several layers of deferred payment and claims lower on a hierarchy being substituted for claims higher up it. Every credit card transaction is a moment of elasticity. As Minsky put it, "in principle every unit can 'create' money—the only problem for the creator being to get it 'accepted.'"[25] This problem, it turns out, is far from an insurmountable one. Money creation is everywhere in a modern economy.

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Banks, insurance companies, hedge funds, venture capitalists, private equity—none of these directly produce things that people can use. None of them take either side of any exchange of goods or services. Like money itself, their function is to facilitate exchanges among others—exchanges that would not otherwise happen. The existence of these industries is a sign of pervasive coordination problems in modern economies; their scale—about 15 percent of GDP in the contemporary United States—is testimony to the scale of these problems.

People sometimes criticize orthodox economics for leaving finance out of its models. This is broadly true, though as with any such criticism it is easy to point to exceptions. A deeper criticism is that the existence of finance—and certainly finance on this scale—challenges the central assumptions of orthodox economics. We cannot assume that, in the absence of specific constraints, any mutually beneficial transaction will take place. We cannot assume that people are, in general, able to allocate their lifetime income to spending in any period. Banks and venture capitalists exist precisely because the existence of a project that would be more valuable to purchasers than the resources it would take to carry out does *not*, in itself, mean that resources will be available for the project. Pensions and insurance companies exist because it is *not* possible for me to directly use my income today to meet my needs in the future (or even to know what they'll be). The idea that markets normally allocate society's scarce means to its most-valued ends is incompatible with the existence of vast industries in which real resources are used up in order to improve allocation.

The vast apparatus of finance implies an equally vast universe of unrealized transactions. Or perhaps a much vaster one—there is no reason to think that the activities that benefit from the services of the liquidity specialists are more than a tiny fraction of the potentially useful activity that goes unrealized. The whole venture capital industry is built on the twin premises that the germs of world-changing innovations are lurking in every dorm room and tinkerer's garage, and these projects will not be carried out without the intervention of specialized (and highly compensated) matchmakers between the idea-havers and those who currently control society's resources.

To be sure, not every innovation turns out to be so world-changing, and it's easy to mock overhyped startups. But it is nonetheless the case that this book was written in Google documents, on Macintosh computers, while talking on Zoom—all genuine and fairly recent contributions of Silicon Valley. The deeper critique of venture capital, it seems to us, is not that its services are unneeded, but that they are provided so unevenly. The businesswoman Elizabeth Holmes famously raised nearly a billion dollars for her fraudulent blood-testing startup, Theranos. Investors were lured in by a persona that was "precision-engineered to appeal to Silicon Valley's vision of itself," as well as by her social connections.[26] But they were also guided by a premise that was correct and important—that there may well be

tremendously valuable products and processes that are achievable with existing resources, but that won't be developed through routine market activity. The problem is that the search for these takes place in such a narrow field. The world is full of people with unrealized potential who don't benefit from the services of specialized liquidity providers.

This does not mean that we can open up endless vistas of progress by making money available in unlimited amounts to everyone. All that would do is destroy its function as a social coordination mechanism.

This was, in essence, Marx's famous critique of Pierre-Joseph Proudhon. Proudhon argued that it was the monopoly over money that was responsible for hierarchy and exploitation in productive enterprises. Since labor was the ultimate basis of value—here he and Marx agreed—why shouldn't workers be able to freely exchange their hours for money (in the form of newly issued labor-chits) directly, rather than having to first sell it to a capitalist? The problem with this plan, argued Marx, was that the requirement that labor be paid only for commodities sold in the market, was a condition for the creation of value in the first place. The scarcity of money, its concentration in the hands of the few, was what enabled it to perform its function of directing labor to productive ends. Replacing the rule of the capitalist with the collective self-rule of the producers required the creation of *new* forms of social coordination, not merely a redistribution of money.

And yet—to turn the paradox around yet again—to say that infinitely abundant, perfectly flexible money would cease to be money is not to say there can be no social gains from changing the terms on which credit is provided, or shifting the balance toward greater flexibility. It does however suggest that these gains—to return to Marx's side of the debate—require institutions to extend liquidity in a strategic, targeted way, and that other conditions for expanding the scope of production are also present. State control of banks and direction of credit has played a central role in most industrialization success stories. Neither microcredit to poor families nor across-the-board monetary reforms have such encouraging track records.

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Money and credit cannot be neutral. The real activities of production depend fundamentally on what kind of future commitments can be used to mobilize resources today. That is, they depend on financing.

The capacity of the financial system to delink expenditure from income is the whole point of it, but it is also why the financial system is a great source of macroeconomic instability. The same flexibility that allows an entrepreneur to ignore market signals to introduce a new product or process allows someone to borrow money for a project that will never pay off. In general, it's not clear until after the fact which is which. Monetary reforms have historically responded to this tension by simultaneously aiming at making the system more rigid and at making it more flexible. This fundamental conflict is often obscured by the focus on specific mechanisms and by the fact that the same person often wants both.

This tension is not resolvable; it's inherent in the coordinating role played by money in production. If you want to start a business, say, you depend both on money's flexibility and on its scarcity. You need to acquire means of payment before producing anything of value, simply on the basis of your promise. But you need, just as much, for the workers and other suppliers of real resources of your business to be *unable* to acquire means of payment, except by first delivering something of value for you.

A business owner who lays out money to make money wants money to be flexible when they need to acquire it at the start of the process, but rigid when the time comes to spend their earnings at the end of it. For capitalism to function it must make money available to entrepreneurs in exchange for a promise, but to workers only in exchange for their lives. Easy credit for me, but not thee: Is this selfish, hypocritical? Yes. But it is unavoidable, as long as our collective activity is organized via money.

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3

Capital

In the previous chapter, we discussed a fundamental tension in discussions of debt. On the one hand, debt has a concrete existence as an obligation to pay a definite quantity of money at a definite date. On the other hand, debt today is the result of someone's decision to borrow money in the past. Incurring the debt allowed the borrower to make payments, and thus to acquire some asset or undertake some concrete activity that they would not otherwise have been able to.

The target of our argument was the assumption, so widespread that it generally goes unspoken, that there is a direct correspondence between these two aspects of debt—that they are equivalent or interchangeable. I borrow my neighbor's shovel today and return it next week; I borrow money to rent a shovel and pay the money back a week later. In both formal economics and everyday common sense, these are two forms of the same thing. As in Edwin Cannan's influential analogy of banks with coat checks, the money loan is just an abstract representation of the loan of a real object. In the textbook, debt and interest are explicitly described as reallocation of real income or consumption over time.

Our point in the previous chapter was that this view is misleading, for two reasons. In the first place, once a debt comes into being, it has an existence independent of the transaction that gave rise to it. The burden of debt in one period depends only in part on the borrowing choices in previous periods; it depends just as much on monetary developments in the intervening time—in particular, interest rates and inflation. Sovereign debt crises are not simply a judgment on unsound choices about real expenditure and taxation but reflect autonomous developments in financial markets.

And in the second place, treating debt as simply a record of loans of real objects and resources obscures the active, transformative role of credit in organizing production. The ability to make payments today independent of income in the past allows new capital goods and social relationships to be

brought into being. For this reason, there is always a tension between flexibility and rigidity in the credit system, which can't be definitely resolved and has no equivalent in a hypothetical nonmonetary economy.

Capital, the other great monetary aggregate, involves the same threefold tension, between quantities of money, real material objects, and the active reorganization of social activity. Perhaps even more than debt, capital is defined by the fusion of these three distinct elements. Capital is not a thing, but a way of organizing human activity. It is a sum of money in the process of being turned into a bigger sum of money; it is a set of concrete tools used in production; and it is a form of authority over people's work. None of these moments is prior to the others. Seeing only one side of this contradictory whole, or treating one as primary and the others as derivative, misses, from our point of view, the essence of what capital is.

The cases of capital and debt are analogous in this respect, but not exactly parallel. Debt has a face value that is normally fixed in money terms, while the market value of assets fluctuates. And credit, while it plays a critical role in rearranging claims on real resources, largely operates outside the production process itself. Whereas hierarchical command over production is constitutive of capital.

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The tension between capital as money and capital as useful things is as old as the concept itself, though which side gets stressed depends on the context. The word "capital," writes the historian Fernand Braudel, "emerged in the twelfth to thirteenth centuries in the sense of funds, stock of merchandise, sum of money, or money carrying interest."[1] The ambiguity is already evident here, although (since profit-seeking enterprises of the Middle Ages were as a rule engaged in trade rather than production) the useful things were goods in transit or in warehouses rather than the buildings and machinery we think of today. By the eighteenth century, the term was almost exclusively used to refer to money; as an adjective, it generally modified "funds." It was only with the Industrial Revolution that the term's center of gravity shifted back toward physical tools. It was Marx as much as anyone who established the association of the term with means of production. John Bates Clark, not long after, introduced the term "capital good" into the lexicon of economics.[2]

The pendulum swung back in the other direction around the turn of the twentieth century, as more wealth took on a financial form.[3] Andrew Carnegie owned the steel mills themselves, but the shareholders of US Steel only owned a monetary claim on them. As the historian Jonathan Levy observes, until the early twentieth century, corporate shares were issued with a par value, which was supposed to reflect the company's accumulated investment in capital goods. This was a conception that made sense if "capital" was imagined as a set of equipment and structures. The corporation, from this point of view, was just a legal device by which their actual owners held title to them. As late as 1899, the *American Banker* could still write that shares whose valuation did not reflect the cost of the underlying capital goods were "nothing more than bags of hope."[4]

Once the main form of industrial enterprise became corporations with widely dispersed shareholders in the early twentieth century, the idea of capital as a definite set of means of production gave way to the idea of capital, as embodied in the share, as a claim on the corporation itself. The value of this claim was now understood to be based on the future earnings of the corporation, rather than its past investment spending. Irving Fisher, perhaps the most prominent US economist of the day, put it clearly: "When values are considered, the causal relation is not from present to the future, but from future to present." As Levy observes, "this reversal of time in economic life counts among capitalism's greatest transformations."[5]

We don't seek to describe all the great transformations, for better and worse, brought about as so much human activity has come to be organized through the logic of capital. Our interest here is in the one highlighted by Levy. We want to focus attention on the fissure between capital as conceived of as a mass of concrete objects—buildings, machines, and so on—on the one hand, and capital as a quantity of money, on the other. We will argue that these two concepts are not equivalent. Monetary wealth, the only form of capital we can observe in the real world, does not at all behave like the object imagined in economic theory—a material substance that exists in a definite quantity and grows over time through accumulated savings. Seeing how these two faces of capital are distinct, and not reducible to each other, opens up space to more clearly perceive the third face of capital, as a relationship, a form of power exercised by some people over others.

In the next section we discuss the textbook view of capital, which treats it as a quasi-physical substance, and explain how estimates of this quantity of capital are produced. These estimates, we show, have no basis in observable reality; they depend on a set of values that cannot be observed but must simply be assumed—or rather, made up. In the following section, we look at capital in its observable as a quantity of wealth, measured in money. Drawing on the work of Thomas Piketty, we argue that changes in capital in this sense cannot be understood in terms of the dynamics of saving, investment, and depreciation, but reflect financial developments and, even more fundamentally, social and institutional changes in the division of income between workers and owners. In the final section, we turn to the third face of capital—neither a mass of means of production nor a quantity of money, but a particular kind of relationship, in which some people are given power over the labor of others. What distinguishes capital as an institution, we suggest, is the historically contingent fusion of these three logically distinct elements.

Capital as Things

While law and finance now accept that the value of assets is a function of beliefs about future profit flows, rather than past investment, this time reversal has not occurred in economic theory. There, the arrow of causality runs firmly the other way. In the textbook world, capital is physical stuff used to make more stuff; profits, expectations, and money have nothing to do with it.

Textbook growth theory taught in economics originates with Keynes's Cambridge contemporaries Frank Ramsey and Roy Harrod and was put in its modern form by Robert Solow.[6] In this story, at a given moment, society possesses a certain physical quantity of capital and labor, which can be combined to produce a certain quantity of output. Output can then be consumed, or it can be invested, yielding more capital in the next period. At the same time, the capital is used up through depreciation. The basic trade-off is between consuming now or saving in order to consume more later; the more capital that society already possesses, the more saving is needed just to maintain current output.

This vision is embodied in two equations that are found, in some form, in any macroeconomics textbook.

$$(1)\ Y = AF(L, K).$$
$$(2)\ K_t = K_{t-1}(1 - d) + S_{t-1}.$$

The first equation says that the total quantity of stuff produced, or output (Y) is a function of the quantities of labor and capital available, increased by some factor A representing technology, institutions, etc. Output and capital here are imagined in physical terms; these are quantities, not market values. And the relationship is supposed to be a regular one. For example, in a typical form of the equation, an increase of 10 percent in the capital stock should reliably lead to a 3 percent increase in output.

The second equation says that this year's capital stock is equal to last year's capital stock plus whatever was added to it through investment, minus some fixed fraction of the capital stock that is lost to depreciation (d) each year. In an isolated economy without foreign trade (a standard assumption in these sorts of models), investment is just equal to saving, so we can think of the capital stock as savings accumulated over time. Capital, in this model, is like water in a bathtub: The level goes up from water coming in from the faucet and goes down from steady evaporation (or when the stopper is pulled). Otherwise, it remains where it was.

Yanis Varoufakis, the Marxian theorist and one-time Greek finance minister, has called this second equation the zeroth law of capital.[7] Often taken for granted by nonmainstream as well as orthodox theorists, it papers over the gap between concrete means of production and monetary wealth. The whole apparatus of modern macroeconomic theory is built on it.

With these two equations, plus some rules for how much output gets saved in each period, we can describe the long-run trajectory of an economy. Over time, the ratio of capital stock to output will converge to some ratio given by the parameters of the model, after which the economy will grow at a constant rate until subjected to some "shock" from outside. Such models of economic growth make up the heart of modern macroeconomics.

In a typical growth model, we assume that capital and labor both face declining returns: You can always get more output by adding more capital or labor, but the more of each you already have, the less of each additional output you'll get for each additional input. The next step after that is to assume that each factor—labor or capital—is compensated according to its marginal product: The pay for one additional hour of labor is equal to the increase in output from that additional labor. In their standard earlier form, the models do not assume different groups of labor and capital providers (or business or finance of any kind), but a single representative agent who both owns all the capital and provides all the labor.[8]

This is a vision of economic growth that would be at home in current computer games where the player is the sole decision-maker—the representative agent—for a nation or civilization. As the textbooks themselves say, these are models of market equilibrium that are identical to the assumption of a benevolent social planner who makes all the decisions in the economy in order to maximize social welfare.

Presumably, most instructors who use this language intend it as merely a heuristic. It's interesting to note, though, that the originator of these models was Frank Ramsey, a mathematical wunderkind who died at the age of twenty-six. Ramsey was sympathetic to the newly formed Soviet Union and spoke out against Western intervention on the side of the Whites; he read Trotsky as well as Marx, and remained interested in the problems of socialism until his death.[9] For him, the question of how a benevolent planner would guide an economy over time was not a hypothetical one.

In the words of Robert Solow, whose eponymous growth model is at its core, this is a "macroeconomics that is deduced from a model in which a single immortal consumer-worker-owner maximizes a . . . time-additive utility function over an infinite horizon, under perfect foresight or rational expectations, and in an institutional and technological environment that favors universal price-taking behavior [i.e., perfect competition]. In effect, the industrial side of the economy carries out the representative consumer-worker-owner's wishes. . . . Basically this is the Ramsey model transformed from a normative account of socially optimal growth into a positive story that is supposed to describe day-to-day behavior in a modern industrial capitalist economy."[10] Solow himself, as the tone of this quote might suggest, was not particularly happy with the body of theory built around his

model. The confusion of a normative theory of how the economy ought to behave under the guidance of a benevolent planner and a positive theory of how the economy actually does behave is worth underlining; growth theory is not the only place it occurs.

There is, to be sure, an important tradition in economics that directly attacks the concept of a physical quantity of capital, associated with Keynes's collaborators Piero Sraffa and Joan Robinson. It questions whether a consistent quantity of capital can be derived from more fundamental economic categories of spending and production.

These questions were central to the Cambridge capital controversies of the 1960s, which pitted Robinson and her colleagues at Cambridge University in the UK against Robert Solow and Paul Samuelson (among others) at the Massachusetts Institute of Technology, located in Cambridge, Massachusetts. The question in this debate was whether, as a matter of logic, one could start from a description of an abstract economy in terms of a variety of production techniques (two units of labor plus three units of corn produce five units of corn two years later, one unit of labor and four units of corn produce seven units of corn two years later, etc.) and derive from it a quantity of capital and an associated profit rate. The US side began from the position that you can; the UK team showed mathematically that you cannot. Team Robinson is generally agreed to have won this debate, and to have proved that the idea of a profit rate based on production technology and the relative abundance of capital and labor cannot be derived from a more general model of exchange and production.

These critics therefore suggest there is something inherently or logically inconsistent, or more generally illegitimate, about the idea of a quantity of capital.

In our view, these criticisms do not quite hit the mark. The problem is *not* that capital and profit, as used by mainstream economists, cannot be rigorously derived from a more general model. Many useful economic categories cannot be so derived. The problem, rather, is the disconnect between the models—logically well founded or otherwise—and the observable reality they're supposed to describe. Joan Robinson and other critics are certainly right that growth models of this kind do not follow from generic assumptions about production and exchange. But so what? The question to ask about a model is whether it gives a good description of the

phenomena we are interested in. There is no reason in principle that a model of capital as a physical stock could not capture important regularities in the behavior of capital as observable money wealth, even if it cannot be rigorously derived from first principles.

The question of whether it is reasonable to think of capital as a physical stock comes down, then, to the validity of the "zeroth law" in practice. If some observable value evolves in a predictable way over time, changing only through identifiable additions and subtractions, then we can usefully treat it as a physical quantity, whether or not it "really" is one. Historically in the physical sciences, for example, the existence of various conserved quantities has allowed for the identification of all sorts of physical objects long before they could be directly observed. If there is something we observe in the real world that has a consistent relationship with measured output, and reliably grows with investment spending, then we can call it *K* in our models. The problem with *K* is that such an object doesn't exist in the real world.

If we measure capital in the way that capitalists do—as a sum of money available for investment—then it does not behave at all like the *K* of the models. Take Jeff Bezos, an exemplary human embodiment of capital. Bezos does not own particular capital goods; rather his wealth takes the form of financial claims on the businesses that own and operate them. Between 2023 and 2024, his net wealth increased from $114 billion to $194 billion, almost all of that from an increase in the value of his 9 percent stake in Amazon.[11] Did the increased value of Amazon shares reflect the accumulation of more means of production at its disposal—more warehouses and server racks? Not according to its financial statements. Over the course of the year, the company reported, its assets rose from $528 billion to $585 billion, while its liabilities were unchanged. Yet its market capitalization—the total value of its outstanding shares—rose from $1 trillion to $1.6 trillion, ten times as much as the addition to its assets.[12] Whatever the increase in Bezos's wealth over the year reflects, it is not the accumulation of capital goods.

As we'll see in the next section, what is true for the individual capitalist is true for capitalist economies as a whole. If we measure capital as wealth —as the net value of businesses, land and other productive assets—then the

growth in total capital over time has little or nothing to do with accumulated savings and investment.

At this point, we can imagine an economist interrupting us. Capital and wealth, they would insist, are two different things. Yes, the share price of Amazon can vary for all sorts of reasons that have nothing to do with material production. But the "capital" in the production function isn't a share price, it's a measure of the actual quantity of tools and equipment available for production. When we estimate our equations, they would say, we don't use wealth, we use a measure of the capital stock from some place like the Penn World Table (PWT). And *that* does behave the way theory expects it to.

Which is true. But it is only true because these measures of capital are constructed to fit the theory.

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If you go to the Federal Reserve Economic Data (FRED) website, you are told that in 2014, Indonesia had a real capital stock of $12 trillion and China had a real capital stock of $61 trillion. The numbers in FRED (and most other similar compendiums) come from the PWT. Published and revised over many decades, these are now on version 10. Each revision provides new numbers. But where do the numbers come from?

You might imagine that they are estimates of the market value of all machinery or fixed assets that are available in each country. If one were to assume that Indonesia could, for example, sell all of its capital stock at current prices, then China could pay $12 trillion and obtain that value of useful productive things. This would be consonant with the idea of capital as the value of fixed assets on the balance sheet of a firm. Alternatively you might think that it reflects the total net wealth in each country—the approach taken by Thomas Piketty and his collaborators, as discussed in the next section.

But in fact, these numbers are not produced in either of these ways. The idea behind these estimates is not to look at the market value of capital, by any definition, today, but instead are constructed based on historical investment spending, with each year's investment added to the estimate of the previous year's capital stock.

Needless to say, this is not a straightforward process. Two big problems stand out: How much of the cumulated investment decays, or depreciates, each year? And how do we assign a starting value for the capital stock? Robert Feenstra, Robert Inklaar, and Marcel Timmer, economists who have worked on documenting and explaining these tables, give perhaps the most thorough explanation in a 2015 paper.[13]

First, all capital goods are classified into six different categories (transport, computers, communication, software, and everything else as "other machinery and assets"). All capital within each category is assumed to behave identically. Investment in each category is obtained or imputed from whatever sources are available. Not every national statistical agency classifies the data in the same way, when they collect it at all. Missing investment values are imputed based on spending in other countries or other years. (A striking feature of the PWT is the absence of blank cells—almost every country has a value filled in for every year of its independent existence.) The flow of investment is then added to the stock of capital in each of the six categories, and the fraction of depreciated capital is subtracted.[14] So to obtain a measure of capital stock in, say, 2019, one needs not only the observed (or at least observable) investment flows, but also measures of unobservable depreciation rates for each category and an initial capital stock.

The procedure used by the PWT (at least through version 9) assumes that a fixed percentage of the capital stock depreciates each year, and that within each category of capital, this rate is equal across all countries and over all time. These rates are all based on a single 1997 paper by Barbara Fraumeni, which summarized Bureau of Economic Analysis (BEA) estimates of US depreciation rates between 1960 and 1990 on a number of industries.[15] For some of these, depreciation rates were calculated from used asset prices, which gives some observational basis for depreciation for capital goods with established secondary markets. Most capital goods, however, are not normally resold—a manufacturer who buys a specialized piece of machinery, or a firm that orders bespoke enterprise software, normally uses it until it is scrapped. Be that as it may, Fraumeni's research did not generally support the assumption that capital goods depreciate at a fixed rate each year.

The bigger problem is that the numbers in this paper were based on a small number of earlier studies, each conducted in one country in one period for industries that do not necessarily match the PWT's categories. These numbers are then applied, willy-nilly, to the whole world for the whole period from 1950 to today. For example, the PWT assumes that buildings of all kinds, everywhere in the world, depreciate at 2 percent a year, based on a few studies of US building sales from the 1960s and 1970s. Likewise, based on a single study of computer obsolescence in 1993, Fraumeni gives an estimate of 31.5 percent for computer depreciation. This rate is then applied by the PWT team to computer capital (whatever that may include) across all countries and time. It is hard to exaggerate the significance of these kinds of accounting decisions. If the rate of depreciation is 2 percent, for example, then about a third of the building capital stock in 1960 is still in use today. By contrast, if the depreciation rate is actually 5 percent, then only 4 percent is.

There is a further and more fundamental question about depreciation, besides the extreme scarcity of observational evidence: What is it supposed to measure? If we imagine capital as a physical quantity, then depreciation is a kind of shrinking. (In one analogy, it is seen as akin to the amount of water evaporating from the bathtub.)[16] But from the point of view of businesses—whose accounting practices are the source of both the concept and such estimates of it as exist—depreciation is a forward-looking concept: It reflects the provisions that have to be made for the eventual replacement of its asset, or its diminished capacity to generate income. These may reflect wear and tear not too different from physical erosion, but they also may reflect technological obsolescence, shifts in demand or other factors that make an asset less suitable for generating revenue without any physical change in it. According to the BEA, on the order of 10 percent of the US capital stock consists of intellectual property assets, and of course, the depreciation of IP "capital" cannot consist of physical wear and tear. This means that depreciation, and thus the capital stock, depends on the rate of new investment, the degree of competition, and so on; we can't think of it as something that already exists, like, say, a country's working-age population.

The second key unobservable is the initial capital stock. Here, there are not even the wisps of observational evidence that is available for depreciation rates. So for the PWT 9, the authors cut the Gordian knot and

simply assume that a country's capital stock, in whatever year they first have investment data for, is 2.7 times its GDP.

(During the Cambridge capital controversies, Joan Robinson used to annoy her American interlocutors by insisting on asking, "But what *is* capital?" If only they'd known they could just reply, "2.7!")

To be sure, this number is not just pulled from the air—or not *quite* pulled from the air. It is based on assuming that every country for which there is investment data back to 1970 was on its long-term steady-state growth path, based on the Solow growth model discussed earlier.

This is an extraordinary assumption, given the many central features of real economies that the Solow model abstracts away from. And even if we thought the model was a good description of real economies, the steady-state path describes the eventual equilibrium after a long period in which there have been no changes in technology, demographics, or consumer preferences. Does anyone imagine this describes the world in 1970?

For the PWT 10, the procedure was modified somewhat. The new initial stocks were still ultimately imputed on the basis of theory, though in a more roundabout way. These changes did nothing about the basic problem that capital stocks cannot be estimated as cumulated investment unless one already knows the initial capital stock. But they did lead to substantial—in some cases, radical—revisions to the numbers. For example, the PWT 9.1 reported that in the 1950s the German capital stock was more than eight times larger than the capital stock of Italy. But in the PWT 10.1, Germany's capital stock in the same decade is only five times larger than Italy's. This in turn has implications for any calculation of capital intensity, total factor productivity or anything that requires a value of the capital stock. Obviously any historical analysis of economic growth based on such unstable values is built on sand.

The use of the Solow model to construct initial capital stocks illustrates a key relationship between theory and data in economics. Rather than use the model to describe observable data, the model is treated as correct a priori, and data are then constructed in conformity to it. This is not a problem limited to measurements of the capital stock, or to economics for that matter. Our argument in this book is that while it appears in a particularly acute and visible way here, it is a general problem for all of us living in a society organized on the basis of money. Money payments and values have

an objective existence in our shared social world. (Jeff Bezos's wealth is real; he really is able to take control of many aspects of our collective life on its basis.) But we should not project an imaginary "real" equivalent of those payments onto the material world.

Modern economics insists on capital as an actual physical quantity, embodied in a production function that reduces human coordination and purposive behavior into a predictable mapping of input onto output. Capital is the stuff that produces more stuff, which accumulates as a society becomes more productive. While the generation of money payments and obligations are central to the behavior of actual capitalists, they are treated by theory as incidental by-products rather than drivers. Instead, the main ingredients of the story are physical machinery and its combination with labor to meet direct human needs. Axel Leijonhufvud describes this vision evocatively: "[Production] is more like a recipe for bouillabaisse where all the ingredients are dumped in a pot, (K, L), heated up, $f(\cdot)$, and the output, X, is ready."[17]

The fact that economies do grow and that material production does involve "capital" and "labor" as distinct social actors gives this vision plausibility; it can seem like common sense. Walk through the cities of the world and crane your neck up at the buildings that reach for the sky; look at aerial maps of Korean harbors over time and see how their geography mutates and spreads with steel and concrete; compare the car-choked cities of urban Asia or Latin America to the countryside: It is impossible to deny that growth is real, and growth means *more*. The labor lawyer Tom Geoghegan recalls bringing a business school professor friend to visit a steel mill in South Chicago, before they all shut down. "Wow," said the friend. "I've never seen so much capital just lying on the ground." The shorthand $Y = AF(L, K)$ captures our intuitions that a steel mill is capital lying on the ground, and about how the accumulation of capital leads to the vast changes in material reality that we see around us.

But, as we've argued through this book, it would be a mistake to assume an equivalence between capital as material volumes of productive goods and capital as a monetary object. Capital is a quantity that can only be measured in money world but is supposed to reflect processes in the real world. It exists as physical means of production and authority in the production process as well as money, but in these forms it is not a quantity.

We can measure buildings and machines, we can describe the authority of the boss, but there is no way to combine these things into a single number. They become a quantity only when claims on the production process are traded for money. The great illusion that shapes so much discussion of capital is the idea that the money value can be projected back onto the social processes that generated them.

Capital as Wealth

There is an unbridgeable gap between a theory that treats capital as a quasi-physical substance, and the reality that capital can only be measured in terms of monetary wealth. Most discussions of capital paper this gap over in various ways, but these expedients depend on not thinking too much about what we are measuring. Anyone who does think about it carefully will have to confront it head-on. An outstanding example of this confrontation is the debates around Thomas Piketty's *Capital in the Twenty-First Century*.

It may be hard to remember now what an extraordinary phenomenon the publication of Piketty's 2014 book was. Even given the political openings provided by the global financial crisis, the speed with which it became the ur-text of economics in the 2010s was still breathtaking. It is rare that a 700-page tome, full of graphs and technical discussions, becomes the leitmotif around which a debate on the nature of the economic system revolves. Looking back now at *Capital in the Twenty-First Century*, however, one of the most striking things about the book is the looseness of the articulation between its theoretical claims and historical analysis. (And of the policy prescriptions with either.)

Capital in the Twenty-First Century describes changes in wealth and income inequality over several centuries, and the ratio of total wealth to national income across the US and larger European countries over the past several centuries. This unique compendium of historical data—much of it derived from tax records that earlier researchers lacked access to—is framed by a theoretical argument based on modified Solow model, with capital owners and labor suppliers as two distinct groups. With a few additional assumptions, Piketty is able to show that, in this model, economic inequality tends to increase when the rate of return on capital exceeds the rate of economic growth ($r > g$). This is the organizing principle

that he uses to explain the evolution of the historical data. References to classic literary works by authors like Jane Austen and Honoré de Balzac and their ideas about wealth distribution, inheritance, and social mobility provide vivid illustrations of his transhistorical claim of a single process as the central driver of distributional shifts. The share of income going to capital owners rises because capital accumulates faster than income grows.

And here immediately we have a problem. The term capital is being used here in two different ways. The capital that is owned is observable, monetary wealth. The capital that accumulates is the quasi-physical substance of theory.

In Piketty's historical material—the many tables you can find online in his World Inequality Database, as well as in the tables in the book—capital means wealth. It is the observable aggregate of property claims, measured in money. Add up the market value of all the real estate, all the corporate stock, all the foreign investment holdings across a society and you have its capital. But in the theoretical passages (and in Piketty's earlier articles that they are based on), capital means a hypothetical aggregate of physical means of production. It is the stuff that is combined with labor to produce output, a definite material quantity that increases through investment and decreases through depreciation.

Piketty's book is important for assessing how well the growth models describe the historical phenomena. This is the question implicitly posed in the book. It is asked more explicitly in a number of contemporaneous articles (many coauthored with Gabriel Zucman), which pose the central question clearly: How much of the variation in the capital-output ratio and capital share of income—over time and between countries—can be explained by treating capital as a physical stock? As it turns out, the answer is not very much.[18]

Applied historically, such models can only explain that part of the variation in income and wealth distribution that corresponds to different rates of accumulation relative to output growth. In other words, it explains the growing income of capitalists only insofar as this income is generated by an increase in the real stock of productive assets under their control, and insofar as this in turn reflects their past saving and investment. The problem is, most historical variation cannot be explained this way. Rather, it reflects developments that the model abstracts from—changes in the flow of output

going to owners of existing capital claims, and changes in the valuation of future capital income.

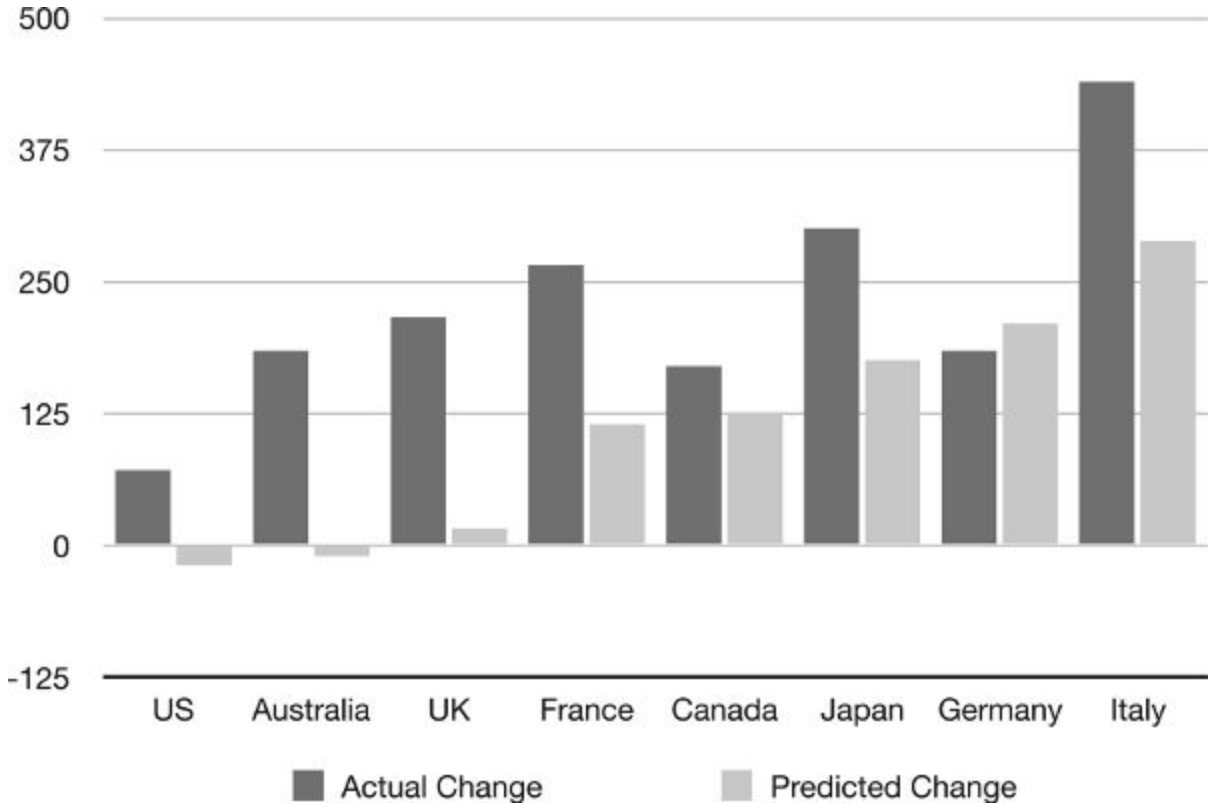
In the orthodox theoretical perspective only accumulation can explain changes in wealth ratios. The capital stock should just be the sum of net investment over time. But from Piketty's data, the key empirical fact is that measured changes in capital have little or nothing to do with accumulation. Treating capital as a physical stock fails to capture either the long-run trajectory of capital-output ratios or the variation in wealth ratios across countries and between different periods.

There are many ways to see this. Here we'll look at the change in the wealth-income ratio in various countries since 1970, using data from Piketty's online appendixes.

The rise in the value of capital relative to current output is one of the central phenomena Piketty wants to understand and underlies his discussion of the increasingly skewed distribution of personal income. In a Solow model, this should be a function of two things: saving, which adds to the stock of capital and thus the numerator of the ratio; and GDP growth, which increases the denominator.[19] In the figure on the next page, the second set of bars shows the change in the wealth ratio that we would predict based on each country's average saving and growth rates over this forty-year period.[20] That is the increase in the wealth ratio that might potentially be explained in terms of accumulation. The first set of bars is the actual change. So, for example, in Italy the ratio of wealth to GDP increased by 437 percentage points in this period (from 247 percent of GDP to 676 percent of GDP). Based on the country's average saving and growth rates over this period, we would have predicted an increase of 291 points.

At first glance, the fit might not look so bad. Italy is the country that the model would predict to have the largest increase in the capital-output ratio and is also the country that actually did. But this is in large part the result of Italy's slow growth during this period. Meanwhile, Germany, for which the model predicts the second-highest increase in the ratio, saw a much smaller increase. (Germany in particular is an interesting case for models of capital as a physical stock, which we'll return to.) Conversely, in the US, the UK, and Australia, measured savings were very low, implying that the capital-output ratio should have been flat or even declined, but all of them in fact saw the ratio increase, the latter two by more than in high-saving Germany.

Apart from high-saving, slow-growing Italy, observed saving and growth rates tell us almost nothing about which countries saw larger or smaller rises in the ratio of wealth to income. Equally important, the actual increase is substantially larger than the predicted increase. That tells us that the rise in wealth relative to income over this period must be largely explained by an increase in the value of existing assets, rather than the accumulation of new ones.



Actual and predicted wealth-income ratios for 2010. These data are from table 5.1 in the online technical appendix of *Capital in the Twenty-First Century*. The predicted values were calculated on the assumption that the average savings and consumption growth rates were constant over the full period. Using annual data would give slightly different results, but the central point—that the Solow-type models do not give accurate actual wealth-income ratios—stands, especially since these models are used to describe long-term tendencies.

If we want to know why the capital share has increased in some countries so much more than others over the past forty years, the Ramsey–Solow approach is missing the main story.

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The value of capital reflects only weakly and indirectly past spending on concrete means of production. It more directly reflects how successful productive enterprises are in generating sales in excess of their production costs, how much of that excess flows to asset owners, and how those assets are valued in financial markets. More broadly, it reflects how much of society is structured by capitalist relations.

For a real-world example, consider the case of Germany.

The European Central Bank (ECB) periodically releases a survey of household wealth across the euro area, and surprisingly, the Germans consistently turn out to be among the least wealthy people in Europe. As of 2023, the median German household reported net worth of about €100,000, compared with €290,000 in Belgium, €200,000 in Spain, €185,000 in France, €150,000 in Italy, and €125,000 in Portugal.[21] Even in Greece, which not long ago experienced one of the most devastating economic crises of any developed country since the Great Depression, median net worth is equal to that in Germany. (Until a few years ago, it was significantly higher.) The pattern is the same if we look at assets rather than net worth—median household assets are lower in Germany than almost anywhere else, including the countries of southern Europe where the crisis of the 2010s hit hardest.

This pattern is basically unchanged since the ECB first published the household wealth in 2013. Initially, it was mostly received in terms of the familiar North-South morality tale, as one more argument for forcing austerity on the shiftless South. Not only had the thrifty Germans been asked to bail out the wastrel Mediterraneans, now it turns out the southerners were actually richer? Why couldn’t they take responsibility for their own debts? No more bailouts!

Politics aside, how can we make sense of the results themselves, given what we know about the economies of Germany and the rest of Europe? Belgium’s GDP per capita is about equal to Germany’s, while those of the other countries are much lower; Greece’s is barely half.[22] Germany has some of the highest incomes in Europe; why is its measured wealth per capita among the lowest?

As it turns out, there are two reasons. First, relatively few Germans own their homes. Germany is one of only two countries in Europe where the majority of households are renters, rather than homeowners. (The other is Switzerland; in Austria, the third lowest, the proportion is just over half.) Spain, Portugal, Italy, and Greece all have homeownership rates of around 75 percent. This difference is especially stark at the bottom end of the distribution—almost all the bottom quintile (by income) of German households are renters, whereas in Greece, Spain, and Italy there is a large fraction of homeowners even at the lowest incomes. This difference is the biggest factor in the wealth anomaly; if we correct for different homeownership rates, per capita wealth in Germany falls somewhere between Spain and Italy.

But by income, Germany is significantly better off than those countries, so there is still a puzzle. The second part of the explanation is less wealth in the form of corporate shares. Compared with other rich countries, especially the English-speaking ones, shares in German corporations have systematically lower valuations relative to their earnings, and relative to the book value of their assets. The latter ratio is known as "Tobin's Q."

Individual capitalists do not themselves own the means of production; they own financial claims on the enterprises that own and operate them. (Think again of Jeff Bezos: In 2024, he owned 9 percent of Amazon, but he did not personally own any warehouses or server farms.)[23] Their wealth does, to some degree, reflect the investment spending of the corporations that they own claims against, but it also reflects how effectively the corporations turn that investment into a monetary surplus; how much of that surplus flows to shareholders, as opposed to workers or other claimants; and the value that financial markets put on a given flow of surplus. All these factors contribute to Tobin's Q.

While there's not much on this problem in *Capital in the Twenty-First Century*, Thomas Piketty has an interesting discussion of it in a later article with Gabriel Zucman: "The higher Tobin's Q in Anglo-Saxon countries might be related to the fact that shareholders have more control on corporations than in Germany, France, and Japan. . . . The 'control right' or 'stakeholder' view of the firm can in principle explain why the market value of corporations is particularly low in Germany (where worker representatives have voting rights in corporate boards without any equity

stake in the company).”[24] In other words, wealth as reflected in assets like corporate shares is not simply a matter of how many useful tools and resources a society has, and the flow of valuable stuff they produce. It critically depends on how much of that flow is subject to tradable property claims. A technological improvement that raises profits will show up as an increase in aggregate wealth, because the increased profits will be capitalized into the price of shares (or other ownership rights over the company). But if workers have enough social power to capture some or all of that improvement, it will not show up as greater wealth, because workers’ claims against the company do not take the form of tradable property rights with a market price.

Worker power is not the only reason that the monetary value of ownership claims on a corporation in the form of stock may diverge from the cumulated spending on investment. One reason for this is that real businesses always enjoy some degree of market power. Businesses using any significant amount of fixed capital must enjoy some degree of market power to be viable, or (as with utilities) have their prices set in some nonmarket way.

It is possible to construct a model where every business has just the right amount of market power to recover its fixed costs. But in the real world, there is no automatic process to bring this about—a fact recognized much more clearly by the first generation of economists to confront capital-intensive industries in the form of railroads, than by most economists today. Real businesses may enjoy more market power than required to recover their costs (during periods of stable, corespective competition) or less market power than required (during periods of cutthroat, destructive competition). Either way, the market value of the corporation as embedded in its stock price will depart from the cumulated total of its past investment. A firm with more market power is more valuable to its shareholders. But it does not represent greater wealth from a social point of view.

Similar considerations apply to homeownership. Low homeownership rates straightforwardly explain lower median wealth in Germany, but why should they imply lower aggregate wealth? After all, rented houses are still owned by someone. Why should the value of a given home depend on whether it is owned or rented? But one of the main reasons that homeownership rates are low in Germany is the exceptionally strong legal

protections for German renters, whose occupancy of their home is not much less secure than that of homeowners. These protections are, in a sense, a form of property right—they are a claim on the future flow of housing services in the same way that a title to a house would be. But with a critical difference: The protections from rent regulation can't be sold and don't show up on the household's balance sheet. In a society with either widespread homeownership or an unregulated rental market, the future value of the services provided by homes will be fully capitalized into their market price and counted as wealth. In a regulated rental market where a substantial fraction of claims on housing services take the nonmarket form of rights for existing tenants, they will not be.

In short, the reason that German household wealth is relatively low, even though German income is quite high, is that a smaller share of claims on production take the form of tradable assets. The typical German family is not poorer than the typical Italians or Spanish one. It's just that they claim more of their income as workers or tenants, rather than as owners.

There's an important political aspect of this—a more equal distribution of wealth does not necessarily mean a more egalitarian society. Where capitalist production prevails, a very large part of our direct claims on the social product are exercised through money payments. Whether you own or rent, your right to your home depends on your payment for it. Almost all the food you eat was purchased. And so on. But it is much less generally true that incomes are derived from assets. For most of us, our main source of income comes from wages or salaries, which we receive by virtue of our capacity to work (and our skills and credentials, which we may have paid to acquire but don't have a market value). Another large part of it comes from claims we exercise as citizens in the form of the "social wage." So while a more equal distribution of income almost always implies a broader capacity for people to meet their substantive needs, a more equal distribution of wealth may instead simply result from the conversion of other types of claims into property rights.

Consider again the case of housing. At one point, the UK had relatively low rates of homeownership, and a very high fraction of social housing. In 1980, close to one-third of English families lived in publicly owned housing, while around 50 percent owned their homes.[25] Under Thatcher, there was a concerted effort to sell off publicly owned homes to their

occupants, resulting in a steep rise in the homeownership rate (to about two-thirds by the mid-1990s, where it remains today). The conversion of public to private housing led to higher and also more equally distributed wealth, but it did not imply better or more secure access to housing.

Today, in countries with public pension systems, there are sometimes proposals to convert them to privately owned accounts. Such measures would certainly generate a more equal distribution of wealth, as today's noncapitalized claims on retirement income were turned into tradable assets. But it's equally certain that they would mean less secure retirement.

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In short, treating capital as a physical stock fails to capture either the long-run trajectory of the capital-output ratio or the variation in wealth across countries and individuals. All of the developments that Piketty describes in his historical material are driven by the valuation changes that he abstracts away from in his formal analysis.

On reflection, this should not be surprising. After all, a substantial part of the capital stock consists of land, which is not produced or accumulated. If land prices did not consistently rise faster than the general price level, then land would have long since declined to a trivial fraction of total wealth. Obviously, this is not the case. According to Piketty's own data residential land alone, exclusive of the value of structures, accounts for between 25 and 40 percent of total private wealth in most rich countries. (The US is on the low end, with 15 percent; unfortunately data are not available for most lower- and middle-income countries.)

Furthermore, as critics like the economist Matt Rognlie pointed out, rising land values account for an even larger share of the *increase* in wealth relative to GDP over the past forty years; in many countries, it accounts for all of it.[26] The Dutch economist Merijn Knibbe, applying Piketty's methodology to the Netherlands (not featured in the book, which focuses mainly on the UK, the US, and France) comes to the same conclusion.[27] The Netherlands shows the same long-run fall, and then rise, in the capital-output ratio that is the central historical axis of *Capital in the Twenty-First Century*, but it is entirely due to changing land values—first the fall in the value of agricultural land relative to GDP; more recently, the rise in the

value of residential land. The long-run "U pattern" in the wealth ratio, Knibbe concludes, "is totally driven by changes in the value of unproduced assets."[28] Saving and accumulation played no part.

Whatever has driven the rise in land values relative to GDP around the world in recent decades, it has nothing to do with the dynamics of accumulation captured by the Solow model, whether in the textbook version or Piketty's. There is no sensible way to think of rising land values as an increase in some physical quantity. The amount of land has stayed the same.

Solow himself, it is worth noting, was quite aware of this problem. The famous article introducing his model explicitly assumes that "The community's stock of capital . . . takes the form of an accumulation of the composite commodity" and that "there is no scarce nonaugmentable resource like land." In a footnote, he acknowledged that this was a serious limitation to his model: "One can imagine," he wrote, that the theory applies only "as long as arable land can be hacked out of the wilderness at essentially constant cost."[29] New building sites in major cities cannot, needless to say, be hacked out of the wilderness!

For Solow—who has been forthright about the limitations of his models, in contrast to their uncritical adoption by others in the economics profession—this was a reasonable simplification; he was interested in experimenting with the formal properties of different growth models, not explaining the historical development of real economies over time. But it is precisely those developments that Piketty wants to shed light on. As he put it in a later article, "the primary ambition of my book was to present this historical material coherently." The formal models "should be viewed as a way of organizing the data, and nothing more."[30] Models that assume away the actual sources of changes in wealth over time are not fit for this purpose.

Economists will often acknowledge that the problem of land values is real, and the rise in the value of land in major cities probably does account for a large part of the modern rise in the capital share. But this acknowledgment seldom leads to any doubts about the validity of the larger apparatus of growth models in which capital appears as a physical stock accumulating over time.

One economist who does take this question seriously is Suresh Naidu, who offered an analysis of *Capital in the Twenty-First Century* that in some ways parallels the argument we are making here.

Naidu distinguishes two distinct visions in the book, which he calls "domesticated Piketty" and "wild Piketty."[31] The domesticated argument—the dominant one in the formal analysis—uses the established framework of economics, treating the capital stock as a quantity that grows over time through investment, and generates income for its owners. The fact that the capital stock and the income are measured in terms of money is, in this vision, unimportant; conceptually, they are both imagined in physical terms. In the "wild" version, on the other hand, the money quantities are the real thing. What exists, fundamentally, is a set of legal and institutional arrangements that entail a set of money payments to owners of certain property rights. Those income streams are capitalized at some rate based on beliefs about their continuance in the future, liquidity and financing conditions, and other factors. The resulting market price is the quantity of capital that we observe.

Naidu's distinction here parallels the turn-of-the-twentieth-century debates about the basis of stock values highlighted by the historian Jonathan Levy. In the domesticated vision, the quantity of capital comes first, and then generates an income; in the wild version, the flow of income comes first, and then is capitalized into an asset value. In the wild version, there is no fundamental difference between the claim on a productive process represented by a share of stock, ownership of land, or for that matter ownership of a slave (the most important form of wealth in the early United States): All are legally enforced titles that give certain specific rights and the expectation of a flow of payments.

Naidu's suggestion that capital should be understood in terms of an institutionally determined flow of money payments to holders of certain property rights, and the market valuation of those rights, is very much a minority view in economics. The vast majority of economists think about "capital" as a thing that can, in principle, be measured in physical terms. The Solow growth model and its offshoots remains the unquestioned core, if not the totality, of graduate macroeconomic education. But there is at least one other prominent economist who does share our criticisms of that framework: Thomas Piketty himself, in his more recent writings.

In his work after *Capital in the Twenty-First Century*, Piketty has moved steadily away from the Solow framework of mainstream economics. This implies a progressive downgrading of the $r > g$ formula from the "crucial

role" he claimed for it in the book. "The inequality $r > g$," he now writes, "plays a certain part in my analysis. However, this is only a relatively modest and limited role . . . on which I was probably not sufficiently clear in my book. . . . In my view, capital is best viewed as a complex, multidimensional set of property relations."[32]

It was a mistake, Piketty now acknowledges, to accept the economics profession's assumption that capital can be treated as a physical quantity. Addressing Naidu's criticisms, he writes, "I feel much closer to the 'wild' interpretation than to the 'domesticated.' . . . I probably should have been more explicit about this."[33]

At the time of *Capital in the Twenty-First Century*, Piketty was still trying to reconcile his empirical work based on measuring observable, monetary wealth, and a theoretical framework that treated capital as a physical substance that accumulates through investment. It is a hard trap to get out of. But in later work, to his credit, he has resolved the tension in the direction of observable reality. Most of the economics profession, by contrast, prefers to live in the imaginary world of the production function, and constructs imaginary data to match.

Capital as Power

Capital exists as a system that allows some people to give orders about production and compels others to obey. That authority is associated with control over particular means of production—buildings, machines, software, and intellectual property rights. But capital exists as a quantity—as something one can measure numerically—only as a quantity of money. In the modern world, that means primarily financial claims on particular production processes. And that quantity can change in response to all sorts of things that make a particular property right more or less valuable. The fact that spending in new means of production is a central way in which the value of these ownership claims is increased is essential to capital's world-making power, its capacity to seize hold of and transform entire societies. But such spending cannot account for changes in the aggregate value of capital over time.

We observed a moment ago that a serious problem for any physical conception of capital is that so much of it consists of land. Land is not

created through investment, but it is essential to production and forms a very large part of monetary wealth.

The problems with land are not, in our view, something that can be corrected for or abstracted away from. They are just a particularly visible manifestation of a more general phenomenon. From our point of view, *all* capital is like the title to land: It is a property right that can generate a money payment to its owner, which is given some value in the marketplace. It is certainly true that concrete capital goods are distinct from the monetary claims that we measure as wealth. But that does not mean that there is such a thing as "capital" in the abstract, as distinct from wealth. There is no way to aggregate all the heterogeneous material objects that make up the former except via the market value of the property claims against them. And because the capital goods are owned, in the great majority of cases, only indirectly via corporations, there is not even a market price for the capital goods themselves, but only for claims against the larger social organisms of which they form part.

Here's a parable that will perhaps clarify what we mean. Imagine a neighborhood in which people like to bake cookies. After baking them, they eat them themselves, or give them to friends, or perhaps sell them—in any case, the cookies are produced with their skill and labor and ingredients and equipment that they have ready access to. Now suppose someone is granted an exclusive right to cookie making in the neighborhood. No one can make cookies without this person giving permission, let's say via a special stamp; they can give or withhold their permission on whatever terms they see fit. Formally, we can now say that the production of cookies requires the labor of the bakers combined with the use of the stamp. If the stamp-holder decides to sell permission to bake cookies, there will be a market price for it, which will depend on the benefit—pecuniary or otherwise—that the bakers get from their baking. The stamp itself may be transferable to third parties. In that case, its market price will depend on the expected flow of income from selling permission to bake, discounted by the market interest rate and the riskiness and illiquidity of this particular income stream, as discussed in the section on interest rates.

So far, we might be talking about land ownership, which looks exactly like this—a state-granted monopoly over a category of production processes (those taking place in a particular geographic area). But our argument is that

capital in general looks like this. It is true that production physically requires buildings, equipment, raw material, and technical knowledge, while baking cookies, in our example, did not require the use of the stamp until the monopoly on cookie making was decreed. But capital income is not paid to the buildings and machinery themselves. It is paid to whoever has been granted a legal monopoly on their use—whoever has the right to forbid a production process involving those things to go forward unless they give their OK. This book originally opened with an excerpt from Bertolt Brecht's poem "Years ago when I" and used Robert Frost's poem "Money" in chapter 1 to illustrate the principle of privity. The last chapter began with Alice Walker's "We Alone." All three had to be cut, because we were unable to secure the rights to them in time—a small but telling example of capital's operation as a veto over a production process. It is also true that many of these technical conditions are themselves the product of human labor. There is no reason to expect the market value of the income stream associated with a particular veto point to be equal to the production cost of the thing over which the veto is exercised. And even if they do coincide, that doesn't imply that the income received by the asset owner is the same as a production cost. The logic of our parable would not be fundamentally different if it were possible, with sufficient time and labor, to make additional cookie-baking permission-granting stamps.

Much of existing capital income looks like compensation for not using one's legal rights to disrupt an existing production process, rather than for deferring consumption in order to contribute something to it. Marx, with his bloodhound's nose for bourgeois hypocrisy, has savage fun with the idea that economic growth happens "solely through the self-chastisement of this modern penitent of Vishnu, the capitalist."[34] Southern slaveowners, he says, might with equal justice take credit for any useful production lashed out of their enslaved workers, since the owners might have drunk it all up as champagne.

Contemporaries who could not have been farther from Marx's politics shared his discomfort with the idea that capital income could be fully explained by the contribution to production from consumption forgone. The nineteenth-century economist Nassau Senior, who insisted that interest and profit were simply the rewards of abstinence, felt obliged to add a caveat that this only applied to those who themselves arranged for the construction of new capital goods. "The revenue arising from a dock or a wharf or a

canal, is profit in the hands of the original constructor. It is the reward of his abstinence in having employed capital for the purposes of production instead of for those of enjoyment. But in the hands of his heir it has all the attributes of rent."[35]

Apart from a sliver of housing wealth, nothing that is called "capital" in today's world is the direct result of work by the person who owns it. So by this standard, all capital income "has all the attributes of rent": It is a legal right to prevent other people from carrying out some production process, which the titleholder can demand payment not to exercise. Yes, a particular capital good may be required for production, but capital income is not paid to the capital good itself, but to a person who holds some ownership claim over it. And that person is not contributing to production. Or more precisely, they are contributing to production only by not exercising their veto over it. Which, as Marx so sharply observed, cannot explain why they are granted that veto in the first place.

It might seem, then, that we are arguing that asset ownership is just a protection racket. It's like how people on the political Right imagine unions. People are doing useful work; the state (or somebody) grants someone the right to shut that work down; now that someone has to get paid a cut. All right then: property is theft (or at least extortion)!

But there is another side to this. Let's return to our cookie-baking story. The stamp owner might not stop at taking a fee for the cookies that are already being baked. Their veto over cookie production also gives them the ability to reorganize it. We might, for example, suppose that the bakers were producing too many cookies, from a revenue-maximizing point of view, say, or an environmental one—maybe all the oven-smoke is polluting the air. But on their own, they don't have any way to enforce the lower level of production that would be best for all of them. The stamp owner is in a position to decide the overall level of cookie production and can internalize these externalities. By limiting the number of cookies baked, he might leave the bakers better off, even after they'd paid for the use of the stamp.

The idea that introducing property rights might improve the welfare of producers using a common resource is known as the tragedy of the commons, a term introduced by Garrett Hardin in 1968 to describe the overexploitation of shared land by traditional farmers and herders.[36] It's important to note that in this context, the term was propaganda rather than

social science, blaming the world's poor for environmental degradation that, in reality, they had little or nothing to do with. As the Nobel Laureate Elinor Ostrom's careful work on numerous communities pointed out, communities making use of shared resources almost always have some system for controlling access to it in a sustainable and more or less fair way.[37] Hardin's tragedy of the commons had more to do with his own racially tinged fears of overpopulation than with actual commons.

Still, we can imagine a tragedy of the commons in cookie baking that the grant of a stamp monopoly might help resolve. Or, we can imagine that the stamp owner might go in the opposite direction; perhaps he can raise the total number of cookies produced. He might straightforwardly achieve this, despite the increased cost his fee imposes on the bakers, by insisting that anyone who baked cookies at all must bake at least a certain number. (This would be analogous to the argument of Stephen Marglin in "What Do Bosses Do?" that much of the productivity gains from early factories came simply from extracting greater effort from more closely supervised workers.)[38] The stamp owner could go a step further and set different quotas for different bakers, based on ability; gathering them in a central location to supervise them would make this easier. Rather than selling the bakers the use of the stamp, he could take ownership of the cookies and then pay the bakers whatever was necessary to keep them from walking away—an amount that would be lower than otherwise because of the legal prohibition on baking on their own. Forcing the bakers to work longer and harder might not be a net gain for society—it presumably wouldn't look like one for the bakers—but in the statistics it would show up as increased productivity: more cookies being produced with the same labor.

With their monopoly on cookie baking, the stamp owner could take further steps to transform the baking process. They could buy a larger oven that the bakers would use collectively, rather than individual ovens in their own homes. They could assign the bakers specialized tasks, instead of each of them doing all the work of making their own individual batches of cookies. The central location where the bakers were gathered—originally, in this story, simply to make them easier to supervise—could be redesigned with efficient baking in mind. The stamp-granted monopoly is not, strictly speaking, required for steps like these, but by centralizing decision-making authority it makes them much easier.

The development of capitalism includes both of these moments. Capital is, fundamentally and in its origins, a transferable grant of a monopoly over some production process, which can be used to generate a flow of payments to the holder. The description of it in terms of ownership of some tangible thing is at best a metaphor, if not an obfuscation. When we say that Elon Musk owns SpaceX, we mean something quite different from when we say that you own your toothbrush. In the former case, ownership describes a relationship of rule over people, not habitual use of a thing. (Ownership of a home is somewhere in between.) And yet these arbitrary, despotic claims, unrooted in any prior labor or other contributions to production, can, under the right circumstances, become the basis of a transformation of the production process that greatly increases our collective command over nature and individual material living standards.

In modern societies, the purest form of this capitalization is in the extensive generation of IP claims. Here there is no "thing" at all that generates output except perhaps the knowledge of the production process itself; IP is simply an enclosure of knowledge. Economists and critics have noted that these claims actually often reduce output to society (consider branded versus generic drugs, or the extending of copyright over decades). But the growth of modern capitalist production often requires this generation of property rights.

The two sides of this process are brilliantly captured in Sven Beckert's magisterial *Empire of Cotton*. Beckert describes a process of "war capitalism," in which new property rights are created by violently granting some titleholder exclusive right to some productive activity—even, as with slavery, the use of another human body.[39] But, as he emphasizes, this process goes hand and hand with, and is eventually largely displaced by, the development of industrial capitalism. Under industrial capitalism, violent appropriation is no longer the source of new property rights; claims on society can only be acquired via a production process that one already has legal authority over. Under industrial capitalism, the acquisition of new claims on human labor requires the direction of that labor to the creation of new means of production. The pursuit of capital, as wealth, now depends on the creation of new capital goods. Property is no longer just pure "theft."

Accumulation—a quantitative increase in the capital under one's control—is an overriding compulsion for capitalists. (Those who don't follow it,

don’t remain capitalists.) But the aggregate effect of this individual drive to accumulate is not “more capital” at an aggregate, society-wide level. Rather, it is a qualitative transformation of social relationships, in particular in the production process. This is a theme developed powerfully in Beckert’s book, and in other Marx-inspired historical writing. *Capitalism Since 1945*, by Philip Armstrong, John Harrison, and Andrew Glyn, is another outstanding example of theoretically informed historical writing, a must-read for anyone interested in understanding world economy in the second half of the twentieth century through a Marxist lens.[40] The profit rates around which they structure much of their narrative are, it is true, constructed on the basis of estimates of the capital stock that suffer from the same fundamental problem as those in the PWT. But in this case that’s only a minor flaw, because the authors are focused on the social transformations driven by the pursuit of profit. Perhaps their core insight is that the breakdowns of postwar capitalism—both immediately after the war and in the 1970s—can be best understood in terms of a loss of capitalist authority over the production process.

We can think of capital, in the first instance, as a property right that allows the holder to prohibit some kind of productive activity that people would otherwise be able to carry out. The owner of such a right may, if they wish, demand payment from producers in order not to exercise their veto. In some cases, that’s where the story ends, making the capital owner a parasitic rentier. But the same veto over production that can be used to reorganize production in ways that develop the forces of production. (It is hard to improve on Marx’s language here.) It is this capacity for centralized coordination, and not decentralized markets, that gives capitalism its progressive character.

This point is made eloquently by Ellen Meiksins Wood in her classic account of the origins of capitalism.[41] In England, she argues, the basic social relations of capital—the use of money to gain control over productive labor, which is then reorganized to generate more commodities for sale with the proceeds used to gain control over more labor—predated the appearance of factories by a century. Capital in this sense was first found in the countryside, in the form of commercial tenant farmers, who leased land from large landowners and operated it with hired labor.

Unlike the landowners themselves, these tenant farmers had no social relationships with those who provided the labor other than a short-term contract. And, critically, the tenant farmers had no ongoing claim to the means of production except insofar as they could acquire it in the market, by renting land. But unlike small proprietors, they were able to assemble large tracts of land and reallocate labor across it. Unlike both landlords and small producers using their own family labor, both labor and means of production appeared to these tenants as monetary costs. And they had, uniquely, both the capacity and the need to reorganize production in a way that increased the monetary value of the product relative to these costs. This might mean draining swamp lands, consolidating fields, or switching crops. What it did *not* mean, in this period, was anything that looks, by modern standards, like investment in capital goods.

What this historical case illustrates is the importance of capital as a property right whose holder is both able and compelled to reorganize production to increase their monetary wealth. This process may—and in the modern world generally does—involve the production of capital goods. But in principle it doesn't have to.

Conversely, in the case of merchant capital—the other stream from which modern industrial capital descends—the process of turning a quantity of money into a greater quantity of money did pass through ownership of a distinct set of material goods. But it did not involve control over a production process. As Fernand Braudel—who emphasizes this second stream—observes, in most of early modern Europe production remained foreign territory for capital, which existed rather in the domains of trade and finance.

Capital is best thought of a process rather than a concrete thing; it passes through different forms in the circuit that defines it. It is a quantity of money being turned into a larger quantity of money; it is a title to concrete means of production; it is authority over a production process. Modern industrial capital is defined by the combination of these three elements. But they are logically, and often historically, distinct.

Since the Industrial Revolution, the most important path from a quantity of money to a greater quantity of money has come via production of specialized, long-lived means of production—factories, machines, and more recently scientific knowledge, exclusive rights over which are granted by

intellectual property. This is not the only such path, to be sure, but it is the one that gives capital its world-making power. Under industrial capitalism, accumulation of monetary wealth is tightly linked to the accumulation of capital goods. This link is a central reason, perhaps *the* reason, that the societies in which production is organized this way have come to dominate and displace other kinds of societies across the globe.

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We are far from the first to observe the tension between capital as accumulated means of production and capital as monetary wealth. Most people who notice this discrepancy tend to think that one perspective is right and the other is wrong. For most economists, as we've mentioned, the cumulated-savings view is the right one, and if the data don't fit it, so much the worse for the data. For strict adherents of the money view, on the other hand, what is real are cashflows and asset values; one needn't bring production into the conversation at all. The pioneering financial economist Fischer Black is an outstanding example of this perspective; its power comes precisely from its narrowness, its ruthless stripping away of all but this one dimension of social reality.

We would like to resist the impulse to tip to one side or the other—for us, the tension is the point. Abstraction is useful; as Marx says in the widely quoted passage in the preface to *Capital*, it is the social scientist's substitute for the telescope or microscope.[42] But some things can only be understood as a contradictory whole. From our point of view the fusion of logically distinct elements is what capital is. It is a quantity of money on the way to being a larger quantity of money. It is concrete means of production. And it is authority over a production process.

It is true that the only *quantities* of wealth we can observe are the present value of expected future income streams. And those streams are never production as such but represent legal claims on some social activity. In this sense, land is no different from other capital; all capital income, as Nassau Senior observed, has the character of rent; all capital is fictitious. But it is *not* incidental that the dominant form of wealth in most modern societies remains claims against production processes embodied in particular businesses, and that increasing the value of those claims typically entails spending money on the creation of new means of production. The defining

fact about industrial capitalism is that the path from money to more money runs through the production process. This is what gives it its world-transforming power.

In Indian classical music, there is a type of performance known as a Jugalbandhi. Literally meaning bound twins, it is a concert involving two solo musicians sometimes even from different traditions, and with their own accompanists who sing or play in the same common Raag. What distinguishes the Jugalbandhi is that the musicians are of the same stature and on equal footing. There is no prior coordination on the piece and musicians sometimes go far ahead of the other, while the other is silent, working within their system, only to relinquish control to the other who does the same in turn. Sometimes they return to sing a line together in conjunction. This is, perhaps, a metaphor for the coevolution of the network of financial claims and valuations on the one hand, and productive capacity on the other. Each moves independently according to its own logic, but it is their relationship to each other that creates the distinct social object we call capital.

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Part 3

Money for Money

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4

The Price of Time

"The theory of the interest rate," wrote Axel Leijonhufvud, "is the center of the confusion in modern macroeconomics. Not all issues in contention originate here. But the inconclusive quarrels—the ill-focused, frustrating ones that drag on because the contending parties cannot agree what the issue is—largely do stem from this source."[1]

As the price of money—the price for flexibility in making payments as opposed to fixed money commitments—the interest rate is a central parameter of money world. The metaphor of "tight" or "loose" conditions for high or low interest rates captures an important truth about the connection between interest and the flexibility or rigidity of the money system. High interest rates correspond to a situation in which promises of future payment are worth less in terms of command over resources today. When it's harder to gain control over real resources with promises of future payment, the pattern of today's payments is more tightly linked to yesterday's income. Conversely, low interest rates mean that a promise of future payments goes a long way in securing resources today. That means that claims on real resources depend less on incomes in the past, and more on beliefs about the future. And because changes in the interest rate always come in an environment of preexisting money commitments, it can also act as a scaling variable, reweighting the claims of creditors against the income of debtors.

Before we start into the labyrinth of interest, here is a brief map of where we are going. We begin in the first section with the idea of interest as the price of saving, that is, of shifting consumption or income in time. The idea of the interest rate as a fundamentally nonmonetary trade-off between present and future has long been the main way that interest is thought of in orthodox economic theory. Then we point to some obstacles—insurmountable, in our view—to mapping this intertemporal price onto the interest rate that we observe in real-world financial contexts. Next, we

explore the attempt to resolve this problem by postulating two distinct interest rates—a market rate actually observed in financial markets, and a "natural" rate that corresponds to the nonmonetary rate of theory. We then discuss how these are "managed" in modern theory and practice. We conclude with the idea that this particular approach is a dead end, and instead we must think of the interest rate in fundamentally monetary terms. This is the Keynesian approach to interest, which is the subject of the next chapter.

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As we try to untangle the confusions around interest, it is important to keep our eyes on the concrete transactions in which it appears. Let's start with the most familiar one.

Say you go to a bank and get a loan. Assuming the bank agrees, what happens? Two new entries in their books are created—your loan, payable to them on a fixed schedule, and a deposit, payable to you at any time. What happens, in other words, in the first instance, is the exchange of two offsetting IOUs. On the one hand, the bank makes a promise to pay money to you, immediately or whenever you want, a promise that can be transferred to third parties to settle your debts to them. This is your newly created bank deposit. On the other side, you make a promise to pay money to the bank, on a fixed schedule extending perhaps many years into the future. On both sides there is, strictly speaking, a promise, but it's the second promise, yours to the bank, that we normally think of as the loan or debt.

Interest is paid by the debtor to the creditor. Since the debt exists, presumably, as the result of a decision to borrow, interest is often described as the cost of borrowing or, conversely, the price of lending. Total promised payments to be made in the future are typically greater than the payment to be made immediately; the interest rate describes the difference between them. One way to think of the interest rate, then, is as the price of a delayed or uncertain promise of money in terms of a more immediate or certain one.

It is one further step to say that interest is the price of *saving*. Interest, in this view, is a payment to someone who has a claim on some part of the social product to temporarily refrain from exercising it, so that someone else can have use of it instead. This makes the monetary debt on which

interest is paid fundamentally similar to the nonmonetary loan of some useful object—a tool or a car, say. By not using the car—by refraining from consumption, which is what saving means—you make the car available for someone else.

This is a small further step—but one that decisively puts you on a different, and, we believe, a wrong path. Understanding how money loans and interest are *not* like the loan of a tangible object was one of the central building blocks of the Keynesian revolution. The loss of that understanding was a central element in the retreat from it. The question of whether interest is in any sense the price of saving is still one of the major divisions between Keynes's followers and their opponents today.

The concept of the interest rate as the price of money is one of the central strands of Keynes's *The General Theory* and the larger vision of the economy it put forward, as we'll discuss in the next chapter. But it wasn't original with him; it's a natural way of thinking if we start from the interest rates we observe in financial markets. The tension between these two views of interest—as the terms of a money contract, and in terms of the trade-off between present and future use of real goods remains a central cleavage in economics today.

Interest and Time Preference

If you are committed to a view of the economy as fundamentally a set of exchanges of real goods, then the existence of interest rate as a distinct, independent variable is a puzzle. The price of a good in terms of money is just a stand-in for its price in terms of other goods. Economic analysis, in this view, requires us to look behind the visible money price for the trade-offs between scarce material things and human desires that it represents. In a credit contract, however, no goods or services change hands; both sides simply commit to a schedule of money payments. Interest, in other words, is a price of money in terms of money. But if money transactions are just a shorthand for the exchange of real goods and services, what does an exchange of money for money reflect? It must have some counterpart in the real world on the other side of the mirror.

One object that interest rates are often imagined to represent is the value of goods today in terms of goods in the future. Imagine a world where there

is only one kind of good, and where you have the ability to give up a quantity of that good in the present for a greater quantity of it in the future. The interest rate, in this world, is simply the ratio of how much you get tomorrow for what you give up today. This is the economy of the literally proverbial ant ("Go to the ant, O sluggard / Observe her ways and be wise / Which, having no chief, officer, or ruler / Prepares her food in the summer and gathers her provision in the harvest").[2] People would prefer to have stuff this year rather than next. But using stuff in production, rather than consuming it, allows us to have more stuff next year. The interest rate, which balances these competing pulls, is a measure of *time preference*.

The idea of interest as compensation for saving, or waiting, is a very old one in economics, although for much of that history interest has been grouped with profit as income from capital. (In the index to the British Marxist Maurice Dobb's classic *Theories of Value and Distribution Since Adam Smith*, the index entry for "interest" says "theory of, see Profit and Capital.")[3] One influential statement of this view came from the early marginalist Nassau Senior, who described interest and profit as "the remuneration for abstinence, and abstinence is the deferring of enjoyment."[4] The choice of word, with its moralizing tone, was no accident. Poulett Scrope's 1833 *Political Economy, for Plain People*—one of the first attempts to explain economic theory to a general audience—was even clearer: Any acceptable theory of capital income, Scrope insisted, must offer "some justification for the immense disparities of fortunes and circumstances that strike the eye on every side."[5] That they are the reward for waiting fits the bill.

The competing idea is that interest is a specifically monetary phenomenon, distinct from the profit obtained from real assets. This view is most present in economics in the work of Keynes and his successors, and we will have a good deal to say about Keynes in this and the next chapter. It was also important to monetary reformers like John Law and Alexander Hamilton, who pointed to lower interest and more abundant credit as benefits of a more expansive money supply. Marx, like some earlier classical economists, saw interest as a fraction of, or deduction from, profit, rather than simply another form of it. And writers more attuned to the concrete reality of financial markets, like Walter Bagehot, took for granted a close link between money and interest. In contemporary mainstream

economics, the link between money and interest continues to underpin most accounts of macroeconomic policy, even as it exists in uneasy tension with a theoretical account of interest in which money plays no role. Overall, though, if the question is, “How do economists think about interest?” a reasonable first-cut answer is, as the price of saving.

In contemporary theory, this concept is formalized as a rational agent choosing the optimal path of consumption over time. The interest rate in this model is the ratio of consumption tomorrow to consumption today that would be chosen by an optimizing consumer. In the world of orthodox economic theory, this is just what interest is. It is telling us what the price of a basket of consumption goods next year should be, in terms of a similar basket today.

To turn this goods-for-goods exchange rate into the interest rate we observe, we have to convert goods into money.

In a world with only one good, this would be straightforward. In the tradition of the classical economists, we will call the good corn.[6] Let’s say a bushel of corn currently costs $10. If the price of corn is constant, then a contract that involves, say, the receipt of $100 today in return for a commitment to pay $110 a year from now, is equivalent to exchanging ten bushels of corn today for eleven bushels of corn in a year. If the price of corn rises from $10 per bushel to $10.50 per bushel between now and next year, then the same money contract will involve an exchange of ten bushels of corn today for about ten and a half bushels of corn next year. We would call this a “real interest rate” of 5 percent. Unless the conditions of production for corn or its desirability now versus in the future change, this real interest rate should be the same regardless of what happens to money prices.

This is the model of the interest rate as the price of saving, which on the terrain of theory remains the orthodox story. In his widely used undergraduate textbook, Gregory Mankiw gives an admirably clear statement: “Saving and investment can be interpreted in terms of supply and demand. In this case, the ‘good’ is loanable funds, and its ‘price’ is the interest rate. Saving is the supply of *loanable funds*—households lend their savings to investors or deposit their savings in a bank that then loans the funds out. Investment is the demand for loanable funds—investors borrow

from the public directly by selling bonds or indirectly by borrowing from banks" (emphasis added).[7]

What do these funds consist of? In more formal versions of the loanable-funds story, it's told in terms of an economy with a "standard commodity," which is used both for consumption and investment. Households receive the commodity as pay, consume some of it, and lend the rest to businesses to invest. In this world, the interest rate is unambiguously defined in terms of the amount of the standard commodity you get back after lending one unit out for a year, and this is also the price that balances households' willingness to temporarily part with some of their goods with businesses' expected profits from using those goods in production.

In any case, the story starts with a fixed pot of goods, which somebody owns. The pot grows over time; both this future growth and who will own it are known to everyone. If you want to give up some claim on goods in the future in return for more goods today, you need to find someone who is willing to make the opposite swap. How many future goods you have to give for each one you get today is the interest rate.

The Elusive "Real" Interest Rate

It might seem like we can correct for price changes in the same way in the real world as in the single-commodity model. Discussions of the "real interest rate" are implicitly imagining something like a corn economy in the background. The ambiguous meaning of the word "funds" in the loanable-funds story is useful for glossing over the transition between what are in fact two quite different concepts.

This is an example of a common and somewhat puzzling feature of modern economic discourse: the use of ambiguous terms with distinct technical and everyday meanings, in order to imply a correspondence between different concepts without having to explicitly argue for it. The term "real" is a particular offender. It conflates the mechanical act of adjusting money interest rates for inflation, with a hypothetical rate that is determined by deeper structural factors.

In the corn economy, this is not a conflation; the two really are equivalent. The terms on which grain today exchanges for grain tomorrow depends, on the one hand, on how much people want grain now versus later,

and how abundant grain is expected to be later compared with now. So the interest rate measured in bushels now for bushels later is “real” in both senses—its measurement is independent of changes in the price level, and it is influenced only by nonmonetary forces.

Unfortunately things aren’t so simple once we leave the model of a single-commodity economy. In a world with multiple goods, trying to think about the monetary interest rate in terms of a trade of goods today for goods later runs into a number of problems.

First, there are now many different contracts that exchange claims in the present with expectations for the future. If I wish to forgo some spending in the present in order to increase my income in the future, I have a number of options. I could purchase a bond or other financial asset; thanks to the interest I receive from it (its coupon or yield), I can spend more in the future than what I paid for the bond today. Or I could start a business or buy an existing one; again, there is an outlay in the present, traded off against an income expected in the future. I could purchase a house; the rent payments I will no longer have to make will, similarly, allow me to spend more in the future. Or I might pay tuition at a college, in the hope of getting a higher income once I graduate; here again, a payment today is being traded off against income in the future. In terms of the corn model, the profit rate of a business, the ratio of the rent payments to the value of a home, or of the college wage premium to the cost of tuition, are all the same as the ratio of the interest payments to the cost of the bond. (As noted earlier, many classical economists referred interchangeably to “profit” and “interest on capital.”)

All of these exchanges involve sacrificing income today in the hope of receiving a greater income in the future. So all of them map equally well onto the “interest rate” of the single good model. Why then do we refer only to the yield of a bond as “the interest rate”?

This wouldn’t be a problem if all of these ratios moved more or less in sync. But in fact, changes in the interest rate are almost completely unrelated to changes in these other ratios, or others that embody a similar trade-off between the cost of an asset and the income from it. This implies that, whatever is changing when the interest rate moves, it is not an economy-wide trade-off between stuff now and stuff in the future.

The second problem is that there are many different baskets of goods that can be purchased with money. In the single-commodity corn world, it is straightforward to define the real interest rate: It's how much corn you can get tomorrow for giving up one bushel of corn today. But in a world with multiple commodities, each will have its own interest rate.

Let's say there are now two commodities, corn and beans. In the first year of our story, a bushel of corn and a bushel of beans each cost $1. But the next year, the price of a bushel of beans rises to $1.10, while the price of corn falls to $0.90. Someone swapping cheap future corn for corn today will face a different real interest rate than someone swapping expensive future beans for beans today. For example, if the interest rate in terms of money is 5 percent, then 100 bushels of corn today will trade for 117 bushels of corn next year ($105/$0.90 = 117). On the other hand, 100 bushels of beans today will trade for ninety-five bushels of beans next year. The "corn rate of interest" is 17 percent, while the "beans rate of interest" is −5 percent. In a nonmonetary world, each of these would have an equally good claim to be the "real" interest rate. There is no unexploited arbitrage opportunity here, no market process that will bring all these rates into equality. The only way the various commodity rates of interest will be equal is if relative prices never change.

We could take an average of the various own rates, based on the mix of corn and beans in the economy. But this doesn't tell us much about the conditions facing individual market participants. Since the mix of commodities being purchased varies across households, industrial businesses, governments, and other types of economic unit, each will face their own "real" interest rate. Each of these will follow a different trajectory.

In the 1920s, Friedrich Hayek sought to build a macroeconomic theory around the idea of nonmonetary interest rates, and the need to keep the actual monetary interest rate close to the true or real rate that would exist in a nonmonetary economy.[8] (This anticipation of today's "natural rate" ideas was borrowed from Wicksell, whose ideas Hayek was largely responsible for introducing to the English-speaking world.) Piero Sraffa, in a scathing response, pointed out that a nonmonetary economy would have a different rate of interest for each different commodity.[9] And, he argued, the differences between these are likely to be especially large precisely when

debates over the level of monetary interest rates are most urgent—in a period of accelerating or decelerating economic growth or major social or technological change. Hayek seemed to admit defeat and abandoned the project. It would be picked up half a century later by mainstream macroeconomists, who were fortunate enough to not have a Sraffa to oppose them.

The third problem is that money is not only used to purchase goods—the consumption loan is very much the exception rather than the rule. Most debts are incurred to generate a flow of income, so the relevant question is the relationship between the money interest rate and the growth of that income. For business borrowers, nominal rates of profit are more relevant to whether interest rates are high or low than the prices of consumption goods are.

Finally, price and income changes are not known in advance and vary over time and across transactions. When we compute a real interest rate by subtracting inflation from the nominal rate, which inflation rate should we use? If it's expected inflation, whose expectations? If it's actual inflation, should it be the average rate over the length of the loan (known only in retrospect), its rate over some past period, or its rate at the instant the loan was contracted? The last is the usual procedure, but it is hard to find any argument in its favor, except convenience.

Still, computing a "real" interest rate by subtracting the inflation rate is a superficially appealing idea. Efforts to do so go back to at least Irving Fisher in the early twentieth century.[10] (The idea that changes in inflation should have no effect on the real interest rate has gotten Fisher's name attached to it, but Fisher himself never believed this.)[11] But until the great inflation of the 1970s, real interest rates remained largely an academic curiosity. Theorists might speak of interest rates in terms of goods tomorrow versus goods today, but discussion of interest rates in business and policy circles remained overwhelmingly focused on nominal rates, without any concern about how this lined up with the theoretical concept. If interest rates were compared with anything to judge whether an apparently high rate was really so, it was more likely prevailing profit rates than the change in the price level. Tellingly, the first two editions of Homer and Sylla's definitive *A History of Interest Rates*, published in 1963 and 1977,

discussed interest rates in entirely nominal terms.[12] The concept of a real or inflation-adjusted interest rate was not even mentioned.

Today, though, virtually all academic work and a substantial part of public discussion of interest rates is in terms of real rates. The confusion between the mechanical act of subtracting (some) inflation rate from the observed interest rate, and a rate determined by deep nonmonetary forces, is a major effect—if not an ideological function—of this usage.

Interest and Saving

It should be clear at this point that there is no straightforward or logically consistent way of translating the monetary interest rates we actually observe into a swap of goods tomorrow for goods today. But there is another version of the loanable-funds story that frames interest as the price of *saving*, rather than of present versus future goods. This is another possible meaning of loanable funds.

Since the "funds" now can be thought of in monetary terms, this avoids the conceptual tangles around the real rate that we discussed above. The interest rate, nonetheless, also cannot be usefully understood in this way. Explaining why was the first of Keynes's three big ideas about interest.

The starting point for the saving story is that in a closed private economy, everything that is produced must be used in one of two ways: it can be consumed or invested. (Introducing foreign trade and a government into the picture complicates the story without changing the fundamental logic.) Investment here means additions to concrete means of production. In the corn economy, again, this is simple: every grain of corn can be either eaten or planted.

Saving is defined as the difference between income and consumption. So by definition, saving equals investment. Put another way, total income must be equal to total spending (whether on consumption or investment). If anyone wants to spend more than their income in a given period, someone else must be spending less. If you want to plant a grain of corn, you must first find someone who has one and convince them to forgo eating it.

It's the interest rate, in this story, that balances investment and saving. When I reduce my consumption, I make part of my income available for borrowing; the interest rate falls until someone finds it worthwhile to

borrow it. Similarly, if I wish to spend more than my income, the interest rate must be high enough for someone else to find it worthwhile to save an equivalent portion of theirs.

The story sounds very logical. But as Keynes pointed out, it rests on a fallacy of composition—an assumption that what is true for one individual within a larger system is also true for the system as a whole. For the individual, income and spending can change independently. A family or business can first see what their income is and then decide how to spend it. But for the economy as a whole, everyone's spending is someone else's income, and everyone's income is someone else's spending. So we can't take income as given when thinking about how much people wish to spend. The two are determined together.

For you as an individual, a decision to consume less is a decision to save more. But this is *not* true at the level of the economy. Your consumption would have been someone else's income—the workers and owners of whatever business makes the stuff you would have consumed. When you reduce your consumption, their income falls by the same amount. If their consumption doesn't change, then their saving must fall by as much as yours rose. Your decision to save increases your saving, but decreases someone else's by exactly the same amount, leaving economy-wide saving unchanged.

Of course, the people whose income falls might reduce their consumption in turn. In that case, their saving does not fall as much as yours rose. But that just kicks the problem on to the next step, because their spending would have been someone else's income in turn. Eventually, somebody's saving will still fall by as much as yours rose. The only difference in this second case is that the total fall in income is greater. (This is the familiar logic of the multiplier.)

You can see this more clearly if you think of *savings* in the sense of money in the bank. When you consume, the value of your bank account goes down. But the money doesn't disappear—the value of someone else's account goes up by just as much. The total amount of savings, in this sense, doesn't change.

The loanable-funds story, Keynes argued, implicitly treats total income as given, while analyzing individual decisions to consume, save, and invest. But total income is precisely the result of those decisions. To think about

variation in spending decisions while holding income constant makes sense at the level of the individual household or business. But it's logically contradictory for the economy as a whole.

It's not the interest rate, then, that adjusts to keep saving and investment equal to each other. It is income and output. When people all attempt to consume less, the result is not higher saving and investment. It is lower income, with total saving unchanged. Changes in total saving are only ever the result, never the cause, of changes in the level of investment. It follows that the interest rate cannot be the price that equalizes saving and investment, because they are always equal. An increase in investment spending immediately increases saving by just as much—there's no need for anyone to first decide to save. As Keynes's student James Meade later put it (using the older term *savings* where we would now say *saving*), "Keynes's intellectual revolution was to shift economists from thinking normally in terms of a model of reality in which a dog called savings wagged his tail labeled investment to thinking in terms of a model in which a dog called investment wagged his tail labeled savings."[13]

Who Sets the Interest Rate?

In the previous section, we started with the intertemporal rate of the textbook and showed why it's so hard to get from there to the interest rates we observe in the real world. There are many transactions that involve spending today to get income in the future—that definition is insufficient to distinguish the interest rate. And the adjustment for changing prices required to translate this trade-off into a rate of interest on money is, in the real world, impossibly complicated. It would require a different set of price changes for each transaction, and indeed for the expectations of each transactor.

We run into an equally serious problem if we start from the money interest rates we observe and ask how they might be derived from an intertemporal trade-off. The loanable-funds stories say nothing about banks or finance. Yet in the real world, interest rates are set by banks, and change based on developments in the financial system and the actions of the central bank. It is, in the first instance, the lending decisions of banks and similar institutions, influenced by the policies of the central bank, that determine

what the interest rate will be. These institutions are neither producers nor consumers of real goods and services. Yes, they employ people and rent land, pay their utility bills, and produce useful goods like research reports and stately marble buildings, but their effect on interest rates comes from their monetary operations, not their role as think tanks or lessees of office space.

Banks are often referred to as "intermediaries" between the ultimate savers and borrowers whose choices determine the interest rate. But compared with other intermediaries—brokers and real estate agents in the property market, say—the banking system appears to play a much more autonomous role. It might be nice if a central housing board could declare a reduction in rents by fiat, in the same way that a central bank can declare a reduction or increase in interest rates, but it cannot. Such a policy would be possible only if the housing board could directly influence the rents property owners were willing to accept—otherwise, there would be nothing available at the stipulated rent. When a central bank cuts rates, on the other hand, it is never constrained by a lack of savings. In everyday language, we talk about what is abundant or scarce when interest rates are low or high, not as saving, but money. It is, after all, "monetary policy," not "savings policy," that the central bank uses. Walter Bagehot was only expressing the common sense of his time, and ours, in *Lombard Street* when he used the term "price of money" as a synonym for the interest rate.[14]

These puzzles mark one of the key fissures between the vision of the economy in terms of the exchange of real stuff, on the one side, and the reality of a network of money payments on the other. Like a flat map laid over a globe, a rigid ideological vision can be made to lie reasonably smoothly over reality in some places only at the cost of ripping or crumpling elsewhere. As Axel Leijonhufvud suggests in the quote that opens this chapter, the interest rate is one of the places that rips in the smooth fabric of economics often occur. As a result, it's been a central problem for economists since the emergence of economics as a distinct body of thought. How does the "real" rate determined by saving and investment demand get translated into the terms set for the exchange of IOUs between the bank and its customer?

One straightforward resolution to the problem is simply to deny that money plays any role in the determination of the interest rate. David

Hume's central argument in his essay "Of Interest" (one of the first discussions in the genealogy of modern economics) was that changes in the supply of money have no effect on the interest rate.

> High interest arises from three circumstances: A great demand for borrowing; little riches to supply that demand; and great profits arising from commerce: And these circumstances are a clear proof of the small advance of commerce and industry, not of the scarcity of gold and silver. . . . Those who have asserted, that the plenty of money was the cause of low interest, seem to have taken a collateral effect for a cause. . . . though both these effects, plenty of money and low interest, naturally arise from commerce and industry, they are altogether independent of each other.[15]

"Riches" here means real, material wealth, so this is an early statement of what we would today call the loanable-funds view of interest rates.[16] Similar strong claims were made in the twentieth century by some monetarists, who insisted that an increase in the supply of money would lead only to higher prices, not to lower interest rates; in one famous formulation, high interest rates are a not a sign that monetary policy is tight, but that is has been loose in the past.

A similar argument has been taken up by some of today's more doctrinaire classical economists, in the form of what is known as neo-Fisherism. If the "real" rate, in the sense of the interest rate adjusted for inflation, is set by the fundamentals of preferences and technology, then central bank actions must change only the nominal rate. This implies that when the central bank raises the nominal interest rate, that must cause inflation to rise—not to fall, as almost everyone (including the central bankers!) believes. Or as one-time Minneapolis Federal Reserve President Narayana Kocherlakota put it, if we believe that money is neutral, then "over the long run, a low Fed funds rate must lead to . . . deflation."[17]

This idea is not quite as strange as it sounds. Imagine a world where the central bank is literally setting the quantity of money in the economy. An increase in the money supply beyond what is needed for current transactions may push down interest rates and increase spending. But as higher spending pulls up prices, more of the new money will be needed for

transactions—in effect, the real stock of money will fall. Eventually, we might suppose, the entire increase in the money stock would be canceled out by higher prices, leaving the interest rate back where it began. So the idea that monetary influences on the interest rate are canceled out by changes in inflation had a superficial logic to it when those influences were imagined as a literal change in the quantity of money—of the relative "scarcity of gold and silver," as Hume put it.

But in a world where the central bank, or the private banking system, is fixing an interest rate rather than a stock of money, this story no longer works. More money, plus higher prices, leaves the real stock of money unchanged. But low nominal interest rates, plus a higher rate of inflation, leave real rates even lower. In a world with a fixed quantity of money, there is an equilibrating mechanism that cancels out monetary disturbances. In the world of endogenous, bank-created money that we live in, there is instead a disequilibrating one that amplifies them.

For the real rate to be ultimately unaffected by monetary policy, low interest rates must somehow lead to lower inflation. But no mechanism has been offered to explain how this comes about. Meanwhile, in the real world, there is clearly management of the interest rate via money. What is it that the money managers are doing, or ought to be doing, according to the interest-as-the-price-of-saving perspective?

Invisible Guideposts, or Navigating by the Stars

Among modern economists, only a few true believers stick with Hume's approach, and flatly deny that money and banks—including the central bank—play a role in setting the interest rate. Most economists are unwilling to go that far. Among other reasons, the privileged role of the central bank as macroeconomic manager is a key prop of policy orthodoxy, essential to stave off the possibility of other more intrusive forms of intervention. So the disjuncture between the monetary interest rate observable in credit markets and the intertemporal interest rate of theory is papered over by the notion of the "natural" interest rate.

This idea, first formulated around the turn of the twentieth century by Swedish economist Knut Wicksell, is that while banks *can* set any interest rate they want, there is only one interest rate consistent with stable prices and, more broadly, appropriate use of society's resources.[18] It is *this* rate,

and not necessarily the interest rate that obtains at any given moment, that is determined by the nonmonetary fundamentals of the economy, and that corresponds to the intertemporal exchange rate of theory.

In the classic formulation of Milton Friedman, the natural rate of interest, with its close cousin the natural rate of unemployment, correspond to the rates that would be "ground out by the Walrasian system of general equilibrium equations, provided there is embedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on."[19] The natural rate of interest, in other words, is the rate that you would calculate from a model of a rational individual trading off present against future—provided that the model included lots of additional features it doesn't actually have.

The Wicksell-Friedman concept of the natural rate has had a decisive influence on economic thinking about interest in the fifty years since. As Axel Leijonhufvud observes, Friedman's 1968 presidential address to the American Economics Association, in which he introduced the concept, has been widely acknowledged as among the most influential publications in the history of macroeconomics. It has been called "very likely the most influential article ever published in an economics journal" (James Tobin), "the most influential article written in macroeconomics in the past two decades" (Robert Gordon), "one of the decisive intellectual achievements of postwar economics" (Paul Krugman), and "easily the most influential paper on macroeconomics published in the postwar era" (Mark Blaug and Robert Skidelsky).[20]

The appeal of the natural-rate concept is clear: It provides a bridge between the nonmonetary intertemporal exchanges of the world of economic theory, and the credit contracts of the monetary world in which we actually live. In so doing, it turns the intertemporal story from a descriptive one to a prescriptive one—from an account of how interest rates *are* determined, to a story about how central banks *should* conduct monetary policy.

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To understand the ideological function of *R**—as economists usually refer to the natural rate—it is useful to look at some examples of how it mediates between the needs of managing a monetary economy and the real-exchange vision through which that economy is supposed to be understood.

Federal Reserve Chair Jerome Powell's 2018 speech "Monetary Policy in a Changing Economy" is a nice example of how monetary policy practitioners think of the natural rate.[21] He introduces the idea of *R** with the statement that "in conventional models of the economy, major economic quantities such as inflation, unemployment, and the growth rate of gross domestic product (GDP) fluctuate around values that are considered 'normal,' or 'natural,' or 'desired.'" The slippage between the three last quoted terms is a ubiquitous and essential feature of discussions of *R**. Like the controlled slipping between the two disks of a clutch in a car, it allows systems moving in quite different ways to be joined up without either fracturing from the stress. The ambiguity between these distinct meanings is itself normal, natural, and desired.

In a monetary policy context, Powell continues, these values are operationalized as "views on the longer-run normal values for the growth rate of GDP, the unemployment rate, and the federal funds rate." Powell immediately glosses this as "fundamental structural features of the economy . . . such as the 'natural rate of unemployment.'" Here again, we have a move from "normal"—something we expect to be true on average—to a "fundamental structural feature" linked to things like technology and demographics, and then to the term "natural," which suggests a normative judgment. (Is "unnatural" ever a term of praise?) The term "natural" also implies beyond human control, and Powell says that these fundamental values are not "chosen by anyone." In the conventions of modeling, such natural, neutral, long-run, unchosen values are denoted with stars, so along with *R** there is *U** (for the natural rate of unemployment) and a bevy of starred Greek letters.

Powell, to be fair, goes on to talk about how difficult it is to navigate by these stars in practice, and criticizes his predecessors who were too quick to raise interest rates based on hazy, imprecise ideas of the natural rate of unemployment. But there's a difference between saying the stars are hard to see and saying they are not there at all. He has not (or, perhaps, assumes his audience has not) escaped the scholastic and tautological habit of

interpreting any failure of interest rates to deliver the expected result as a sign that the natural rate must have changed.

It is true that if there is any reasonably stable relationship between the policy rate controlled by the Fed and a target like GDP or unemployment, then at any particular moment there is presumably some interest rate that would move that target to its desired level. But the fact that an action can produce a desired result doesn't make it "natural" in any sense, or an unchanging structural feature of the world.

Suppose, for example, that we are experiencing a booming economy, with wages and prices rising faster than the central bank thinks is consistent with price stability. It is not implausible that a sufficient hike in interest rates could discourage new spending, slowing growth and raising unemployment. Nor is it implausible that this would result in lower inflation. In principle, one could even identify a specific interest rate that would lead to inflation falling to whatever level the central bank thinks is acceptable.

You can, if you like, call this interest rate the "natural" rate. But it is not natural in any larger sense. It will depend on all the other factors influencing credit conditions and demand at that particular moment. Anything that encourages lending or boosts spending will require more restrictive action by the central bank to offset, implying a higher natural rate, in this sense. Anything that limits credit or discourages spending implies a lower one. Every change in public spending or taxes, in bank regulation, in the trade balance, in the sentiments of consumers or entrepreneurs, every technological regress, every extreme weather event or foreign crisis, implies a new natural rate. This is as far from a fundamental structural feature as you can get.

Powell didn't make any effort to associate his normal or natural values with a particular theoretical model. But the normal and natural next step is to identify "fundamental structural features" of the world with the parameters of a nonmonetary model of real exchange among rational agents. In the world of macroeconomics theory, that is exactly what "deep structural parameters" are.

Alongside the monetarist counterrevolution against Keynes was a deeper and more lasting one, led by Robert Lucas. In the usage of Lucas and his followers, which has come to dominate academic macroeconomics,

structural parameters are those that describe the rational choices of agents based only on their preferences and the given, objective production function describing the economy.[22] There's no reason to think Powell has this narrower meaning in mind, but it's precisely the possibility of mapping these meanings onto each other that allows the "natural rate" and its cousins to perform their ideological role.

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For an example of that next step, consider a report from the Centre for Economic Policy Research (CEPR), a body that plays a role for European economists similar to what the National Bureau of Economic Research does in the US.[23]

The CEPR economists begin with the key catechism of the real-exchange view of interest: "At its most basic level, the interest rate is the 'price of time'—the remuneration for postponing spending into the future." *R**, then, is a rate of interest determined by purely nonmonetary factors—it should be unaffected by developments in the financial system. This nonmonetary rate, "while unobservable . . . provides a useful guidepost for monetary policy as it captures the level of the interest rate at which monetary policy can be considered neutral . . . when the economy runs below potential, pushing actual real policy rates sufficiently below *R** makes policy expansionary." The notion of an unobservable guidepost doesn't seem to have given the CEPR authors any pause, but it perfectly distills the contradiction embodied in the idea of *R**. We can write down a model in which everyone has a known income over all future time and can freely trade future income against present income without the need for specialized intermediaries. We can then ask, given various parameters, what the going rate would be for a trade of a good at some future date for the same good today. But given that we live in a world where the future is uncertain, where liquidity constraints are ubiquitous, and where a huge specialized financial system exists precisely in order to overcome them, how do we pick one such model and say that it is the model that corresponds to the real world?

Even if we somehow picked one, we'd still face the question from the last section: Why would the intertemporal exchange rate in that world be informative for the appropriate level of monetary interest rates on our own, especially since the model abstracts away from all the features of the

economy that make monetary policy necessary, and possible, in the first place? In the world of the natural rate, there is no possibility for the economy to ever "run below potential" (or above it). Nor, if "the interest rate" refers to myriad private exchanges of the present for future goods, would there be any way for a single institution like a central bank to change the terms of all of them at once.

Michael Woodford, whose widely used graduate textbook *Interest and Prices* is perhaps the most influential statement of this way of thinking about monetary policy, is, unusually, at least conscious of this problem.[24] Early in the book, he notes that most accounts of monetary policy treat it as if the central bank is simply able to fix the price of all loan transactions. But it's not at all clear how it does this, or where it gets the power to do so. He feels obliged to offer the hypothetical case where all exchanges between present and future had to be routed through one central clearinghouse to explain how you could have a rate-setting central bank in a nonmonetary world.

Needless to say, this sort of universal clearinghouse is not at all what actual central banks are, and it's a bit awkward—to put it mildly—to have a model of a market economy in which no one can sign a contract except on terms dictated by a specialized public institution. But at least Woodford sees the problem; the vast majority of people using this framework breeze right past it.

The CEPR writers, for instance, arrive at a definition of the natural rate as "the real rate of interest that, averaged over the business cycle, balances the supply and demand of loanable funds, while keeping aggregate demand in line with potential output to prevent undue inflationary or deflationary pressure."[25] This definition simply jams together the intertemporal "interest rate" of the imagined nonmonetary world with the interest rate target for monetary policy, without establishing any actual link between them. (Here again we see the natural rate as the clutch between theory and policy.) "Loanable funds" are supposed to be the real goods that their owners don't currently want, which they agree to let someone else use. The conjunction "while" suggests that these are two different criteria—that there could in principle be an interest rate that keeps output at potential and inflation on target but fails to clear the market for loanable funds. But what could this mean? The operational meaning of the natural rate is that any rate

associated with the macroeconomic outcomes sought by the central bank is, by definition, the "natural" one. And as discussed above, the dependence of income on spending means that the market for loanable funds always clears. There is no need for a market price balancing investment and saving, because any change in investment produces an equal change in saving.

In practice, the operational part of the CEPR definition is the last clause, about "undue inflationary or deflationary pressures." The natural rate means just this: At their meeting in Frankfurt, the Governing Council of the European Central Bank has set the interest rate under their control at a level they think will lead to their preferred outcomes for GDP, inflation, the unemployment rate, etc. Meanwhile, somewhere else in the building, theorists are imagining worlds in which rational agents trade present goods for future goods. In some such world, the exchange rate between present and future goods would be the same as the policy rate the council has chosen. So the choice must be the optimal one.

There is still the problem that there are many interest rates, depending on factors like the length of the loan, the identity of the borrower, the presence of collateral, covenants and so on, and the existence of a secondary market. The way this second problem is addressed is informative.

For the CEPR writers, the interest rate consists of the risk-free rate (set somehow by the central bank) and the credit risk of the borrower—the chance they will default on the loan. This maintains the link between the intertemporal rate of theory and real-world interest rates, since defaults could exist even in a nonmonetary world. But what it excludes is all the specifically financial factors that influence interest rates. Interest rates depend not just on the characteristics of the borrower but the characteristics of the lender. A well-capitalized bank that has easy access to credit from other banks or a central bank, and can easily sell its loans into a secondary market, can lend at a lower rate.

These factors are not trivial. They are the very reason the financial system exists in the first place. In the US, for instance, a long-standing goal of policy—from the establishment of Fannie Mae and Freddie Mac in the mid-twentieth century to the Fed's massive purchases of mortgage-backed securities after 2009—has been to ensure a robust secondary market for residential mortgages. There has been a near consensus that allowing banks

to securitize and sell off their mortgages leads to lower interest rates and easier conditions for residential borrowers.

Leave aside for a moment the desirability of mass homeownership, and the risks and costs of policies to encourage it. What we're interested in here is why a vast specialized system of housing finance should be needed in the first place. In a world where borrowing terms were set simply as "the" interest rate plus credit risk, there would be no need for it. The only reason Fannie Mae, securitization, and the rest serve any purpose is that borrowing costs depend as much on all sorts of specific financial factors as on the riskiness of the borrower.

In a world where people could directly exchange present goods for future goods, there would be no need for mortgage-backed securities, or for specialized financial products called mortgages, or for banks. The buyer of the house could just transfer their future income directly to the seller. It is precisely the impossibility of doing this that is why finance, including interest rates, exist in the first place. The scarce resource being allocated is not saving, but *liquidity*—but we will come to that in the next chapter.

Returning to risk: The salient fact about a financial crisis is that credit dries up not just for risky borrowers, but for everyone. If all that had happened after 2008 was that families who now appeared to be riskier borrowers faced higher mortgage rates, there would have been no crisis. The reason borrowers across the board faced tighter credit was not because their debt had become riskier, but because banks had become more reluctant to hold it. Similarly, if we look historically at the premium of corporate bond rates over the policy rate, there is essentially no relationship with subsequent default rates. Instead, the premium reflects liquidity conditions for lenders.

In a world where there was only an economy-wide risk-free rate and borrower-specific credit risk, there would be no need for a central bank in its historically primary role as lender of resort and peak institution of the financial system. And if the risk-free rate reflects a trade between present and future goods, it is not clear why a central bank, which neither produces nor consumes goods in either the present or the future, would be able to influence it. It is only because the interest rate is determined mainly by liquidity that a central bank—which is a producer of liquidity—is able to influence it, or has any reason to.

Summing Up and Moving On

The interest rate, as we observe it in the real world, is a price, the terms of an exchange. A new loan is fundamentally a swap of two IOUs: one that is payable immediately and can be transferred to third parties to satisfy your obligations to them, and one that is payable on a fixed schedule and cannot itself be used to satisfy payment obligations. The greater the future payment that exchanges for the same payment today, the higher the rate of interest.

This is what interest rates look like in concrete reality. If we want to analyze them, think about what they mean, where they come from and why they matter, we have to decide which features are essential and which are incidental.

One way to do this is to say that the essential element is the exchange of something now for something in the future. The fact that the specific thing in question is money is, from this point of view, incidental. A swap of money today for money tomorrow is not fundamentally different from giving someone the use of some real thing today in return for a promise it will be returned in the future. A bank, in this view, is essentially similar to a safe deposit box, or a coat check. I give you my coat now and you give it back to me after the show—plus, perhaps, some consideration to compensate me for the fact that you've had the use of it in the meantime. There is, in this story, nothing specifically monetary about interest, and its essential properties can be worked out in a model that doesn't include money. This is the loanable-funds view of the interest rate.

Alternatively, we could look at the interest rate in terms of a swap of two assets, one that can be used for immediate payment and the other that cannot. The essential feature of the transaction from this point of view is the difference in liquidity between the assets being exchanged, or the change in balance sheet positions. Both lender and borrower are gaining a claim they can exercise in the future; both are committing to future payments. The fundamental trade-off, then, is not between the present and the future, but between income and flexibility. The interest rate, in this view, cannot be understood in a framework that doesn't include money, or at least "moneyness"—the degree to which something can be used to make immediate payments. This is the liquidity preference view of the interest rate.

At this level, both perspectives seem reasonable—both identify genuine elements of the interest rate transaction. One might expect a useful analysis of interest to incorporate elements of both. But in our view, this is not the case. The second perspective is right, and the first one is wrong. There are at best only very convoluted ways to connect the loanable-funds (or real-exchange) vision of interest to the phenomenon we observe in the real world. Trade-offs between present and future certainly exist. But interest is not one of them.

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5

Liquidity and Convention

In this chapter we turn to Keynes's answer about what interest is—or rather, his two distinct answers.

In the first section we introduce the first of these solutions, the idea of *liquidity*. In many contexts, we suggest, interest can be thought of as the cost of flexibility, of keeping your options open. Liquidity can explain why interest is paid in a case like the bank loan we introduced at the beginning of the last chapter. Neither side of that transaction is giving up the use of any real good or service, or current income; both are receiving an IOU. But one of them is getting a flexible claim that can be redeemed or transferred as they see fit, and has a fixed value, while the other is getting a less flexible claim that allows them to demand payment only on a fixed schedule. Interest, in this case, is compensation paid by the side that receives the less flexible claim to the side that holds the more flexible one.

Thinking of interest as the price of liquidity clarifies why money is never neutral. The degree to which people are in a position to meet unexpected obligations or opportunities limits the kinds of long-term commitments they can enter. And this in turn determines how productive activity can be organized. The technical advantages of long-lived means of production and specialized organizations can only be realized if people are in a position to make long-term commitments. And in a world where production is organized mainly through money payments, that in turn depends on the degree of liquidity.

In the next section, we turn from bank loans to the other setting where interest appears—markets for existing assets. Here the liquidity story needs to be supplemented with Keynes's second story, which focuses on the possibility of unexpected changes in asset values. Framing interest in terms of the price of existing assets rather than the terms on which new loans are made offers some striking new illustrations of the importance of liquidity. But it also introduces a role for *convention* in the determination of asset

values. To some important extent, bond prices—and therefore interest rates—are what they are, because that is what market participants expect them to be.

Keynes discussed both conventional asset prices and the desire for flexibility in terms of "liquidity preference," as if they were two ways of describing the same thing. But in fact, we suggest, these are two quite different ways of thinking about interest rates, which fit different contexts, and may have very different implications.

In the final section of the chapter, we turn to some concrete implications of thinking about interest in terms of liquidity and convention. Most importantly, it clarifies what central banks actually do. A puzzle for the view of interest as the price of saving, as we noted in the previous chapter, is that it is hard to see how it could be either necessary or possible for central banks to influence interest rates. This is not a problem for a monetary view of them.

Furthermore, the implications of thinking about interest in these terms have tangible payoffs for understanding macroeconomic dynamics. The dynamics of debt over time, a critical arena of macroeconomic debate, are also clearer when we think in these terms. As discussed in chapter 2, changes in debt-income ratios historically have as much to do with the specific monetary factors of inflation and interest rates, as with the borrowing behavior they are usually attributed to.

Liquidity

Where *do* interest rates come from, if not from the rate of time preference balanced against the rewards of waiting? The alternative is to take seriously the idea that interest is the price of money. Which in turn means that money must be something other than a neutral stand-in or measure for real goods, but something valuable in itself.

The valuable thing that money is providing—and that the interest rate is the price of—is *liquidity*. This was Keynes's second big idea about interest (the first was that income, and not interest rates, is what adjusts to keep savings and investment equal). The relationship between money and interest is a central part of his vision, and of that of many of the more radical

economists who followed him. There's a reason that the full title of his book is *The General Theory of Employment, Interest, and Money*.

At one level, it is easy enough to define liquidity. As the *Oxford English Dictionary* puts it blandly, it is "the interchangeability of assets and money."[1] But, as Mike Beggs discusses in his brilliant 2012 essay "Liquidity as a Social Relation," that terse description hides a multitude of complexities.[2] Is the interchangeability a property of the asset or of the money? Or is it something brought about by institutions and policy? (We often describe a situation of low interest rates as one that is liquidity abundant.) Liquidity, as Beggs puts it, is not a property of an asset in isolation, but a relationship between people—the whole set of institutional arrangements that make it easier or harder to exchange promises and ownership claims. Something is designated liquid or illiquid only in the context of its place in this wider network; when that network changes, so does liquidity.

This vision of liquidity as a property of the whole network of market institutions, and not of particular assets, is familiar to market participants and thoughtful financial journalists.[3] But it is largely absent from economics, perhaps because it is challenging to formalize in a precise way.

For now, let's say that liquidity describes the ability to make unexpected payments as they come due, or more broadly, the ability to change your choices later on in response to unexpected contingencies. To see what this means in practice, let's return to the mortgage loan that we started our discussion of interest with.

On the day the homebuyers settle, they visit the bank to finalize their mortgage. The bank manager puts in two ledger entries: a credit to the couple's deposit account and a credit to the bank's own account. The first is an IOU from the bank to the couple—this is the deposit at the bank, newly created at that moment. The second is an IOU from the couple to the bank, money flows payable every month, typically, in the US, for the next thirty years. These ledger entries are made simply by recording them—in earlier times it was called fountain pen money because that was all that was needed to make it.

The deposit is then immediately transferred to the seller, in return for the title to the house. For the bank, this simply means changing the name on the deposit—in effect, the couple communicates to the bank that the debt

payable to them is now payable to the seller. On the balance sheet of the couple themselves, one asset is swapped for another—the $250,000 deposit, in this case, for a house worth $250,000. (The values are always identical—the only way the value of the house is defined, is by how much it sells for.) The seller makes the opposite swap, giving up the title to a house for an equal value IOU from the bank.

The deposit is liquid: it can be exchanged for the house or all sorts of other things. The house is illiquid, because ownership of the house cannot be used to make other payments except after a lengthy and uncertain process of finding a new buyer and, usually, arranging new financing. But the degree to which this is true depends on the current housing market, and the institutions in place to facilitate home sales.

The mortgage, in any case, is not a loan of preexisting funds or of anything else. The money that was loaned was created in the process of making the loan itself. Banking does *not* channel saving to borrowing as in the loanable-funds view, but allows a swap of money flows, structured over time.

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Banks create money. They do so by creating a liability—a loan—which creates a corresponding asset—a deposit—that the public can use for their purchases. For those steeped in historical debates or who know the basics of the world of money, this is a bland and accurate description of the operations of money world. But for most others, there is something troubling, even subversive, about this idea. Money, given its totemic nature and undoubted power in shaping lives, is something that we seem to want to have been generated outside of human control (and certainly outside the control of the local bank manager). As John Kenneth Galbraith put it, “The process by which banks create money is so simple that the mind is repelled. When something so important is involved, a deeper mystery seems only decent.”[4]

It is perhaps a symptom of this psychic discomfort that money and banking textbooks seldom discuss the fact that banks create money in the process of lending, and instead focus on the role of banks as intermediaries. A typical money and banking book, for example, suggests: “When a depositor puts money in a checking account and the bank uses the money to

finance a loan, the bank has transformed a financial asset (a deposit) for a saver into a liability (a loan) for a borrower. Like other businesses, a bank takes inputs, adds value to them, and delivers outputs."[5] There is something comforting and familiar about this vision, a sort of conservation principle in which "money" is an asset given from outside the system and simply lent on, with some value addition (risk analysis) thrown in by the bank.

This is why even people who understand the workings of the monetary system often discuss it on the (implicit or explicit) assumption that banks are normally "fully loaned up," so they need additional reserves to back any new loans. In that case, the system behaves *as if* there was a fixed stock of savings. This is the implicit model that is still used in many textbooks. It was defensible—though incomplete and often misleading—in the mid-twentieth century, when tightly regulated banking systems could indeed be constrained by a limited supply of government-supplied reserves. But it has been decades since reserve requirements were binding in this way.

The other maneuver, drawing from the Wicksellian tradition, is to assume that the real world itself has reached saturation—that the universe of real expenditure that can be financed is strictly limited. Thus, even if in principle banks can create money by loaning any amount without prior savings, such an action would simply be inflationary.

In the world of policy and politics, the same impulses of discomfort often lead to attempts to do away with the process of endogenous liquidity provision altogether. An example is the Chicago plan devised in the 1930s that sought to split the "monetary" versus "credit" systems of the economy and that required deposits to be backed 100 percent by reserves.[6] This idea is periodically resurrected whenever the autonomous role of bank credit creation comes into public visibility.

Another "solution," usually more popular on the right, is provided by alternative payments systems like Bitcoin, which seek to build limits to money expansion into the mechanics of the system itself. Such efforts—where they do not simply collapse in a wave of bubbles and fraud—inevitably reinvent their own forms of endogenous money creation, as payment shifts from the token itself to claims against it. Someone who wants to make a Bitcoin payment in 2023 is much more likely to do so by transferring an account at a third-party site like Coinbase than from their own digital wallet.

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Let us return once more to our mortgage loan. This is a transaction between the bank and homebuyers (and the seller). The bank made a promise to the borrowers, and the borrowers made a promise to the bank. The fundamental role of the bank, as Hyman Minsky emphasized, is not intermediation but *acceptance*. Banks function as third parties who broaden the range of transactions that can take place on the basis of promises. The buyer is willing to commit to a flow of money payments to gain legal rights to the house. But this by itself is unlikely to be enough to acquire them. Even if the seller trusts the buyer, and even if they had means to enforce the promise, the fact that the buyer is not widely known to others means that their promise of future payment can't be used to meet the seller's current obligations. The bank, on the other hand, precisely because its own promises are widely trusted, is in a position to accept the promise of the buyer.

As for saving and dissaving, there isn't any, by anyone. Everyone's net worth is unchanged. This is typical of credit transactions.

Nor is anyone trading present income against future income. For the buyers, the value of the housing services they get from the house are greater than the rent they would otherwise be paying—if not, presumably, they wouldn't be buying the house. And this gap is likely to rise over time, since mortgage payments are fixed while rents tend to rise. In a real-exchange world of textbooks, where the interest rate balances present and future, the borrower gives up income in the future to spend more today. But in this transaction, the borrower is *gaining* future income. Bring down payments and transaction costs into the picture, and the borrowers are probably left with less money for consumption today—exactly the opposite of "borrowing" in a real-exchange world.

Meanwhile, the bank is profiting from the loan in every period, since the mortgage interest rate exceeds the interest rate that it pays on its own liabilities. (If this weren't true, they would not make the loan.) Writing a loan does not require the bank's owners, shareholders, or other depositors to give up any spending in the present. Like the borrower, the bank is not trading off future income against present income but gaining income in every period.

But there is nonetheless a cost, on both sides. The balance sheets of both parties are now less liquid. This is *the* fundamental trade-off in the credit market.

The net result of the transaction is that the household has committed itself to a set of fixed money payments over the next thirty years, and acquired the legal rights associated with ownership of the home. These rights are presumably worth more to the family than the rental housing they could acquire with a similar flow of money payments. In this sense, the transaction is income-positive for the buyer. But title to the house cannot easily be turned back into money and thereby a claim on other parts of the social product. Homeownership involves—for better or worse—a long-term commitment to live in a particular palace.

The trade-off the homebuyer has made by borrowing is not more consumption today in exchange for less consumption tomorrow. It is a higher level of consumption today *and* tomorrow, in exchange for reduced flexibility in their budget and where they will live. Both the commitment to making the mortgage payments and the nonfungibility of homeownership leave them less leeway to adapt to unexpected future developments.

On the other side, the bank has added a deposit liability, which requires payment at any time, and a mortgage asset that in itself promises payment only on a fixed schedule in the future. This likewise reduces the bank's freedom of maneuver. They are exposed not only to the risk that the borrower will not make payments, but also to the risk of capital loss if interest rates rise during the period they hold the mortgage, and to the risk that the mortgage will not be salable in an emergency, or only salable at an unexpectedly low price. As the example of the 2023 Silicon Valley Bank debacle shows, these latter risks may in practice be much more serious than the default risk that orthodox writers regard as the sole basis for interest rate spreads.

The cost to the bank making the loan, in other words, is *not* that present consumption must be deferred. Neither the bank's depositors nor its shareholders need to reduce their consumption spending for the bank to make additional loans. The cost to the bank is that its balance sheet becomes more fragile.

Step back and ask, what stops households from borrowing more? It is not a limited supply of savings. Rather, it's that each additional loan—each new

commitment to future money payments—leaves their balance sheet less liquid, more vulnerable to unforeseen developments that might leave them unable to meet their commitments. This increasing risk will both make the borrower less willing to take on new loans, and the bank less willing to lend to them. This idea was formalized by Minsky as lender's risk and borrower's risk, both of which rise as a given borrower takes on more debt.[7] It is these risks, this diminishing liquidity, that limit the availability of credit, and not any scarcity of real resources.

Or as Keynes put it in a 1937 article, the interest rate in a system in which banks and near banks determine the effective quantity of money can be regarded "as being determined by the interplay of the terms on which the public desires to become more or less liquid and those on which the banking system is ready to become more or less unliquid."[8]

Liquidity and "Real" Rates

Seeing the interest rate as the price of liquidity makes it clear why the search for a "real" interest rate is so fruitless. The pattern of asset prices we call interest rates reflect the terms on which more and less liquid claims can be swapped for each other. The claims on both sides are specified in terms of money, so there's no reason for them to be affected by exchange rates between monetary assets in general and nonmonetary claims. You can calculate "real" exchange rates after the fact, using whatever inflation rate and time period you choose. But there is no reason for actual or expected inflation to be incorporated into market interest rates. No reason, that is, except insofar as a central bank deliberately brings this about.

In modern economies, central banks do aggressively—though not always successfully—seek to raise interest rates in response to higher inflation rates. But if we look at earlier periods, or settings where monetary policy in the modern sense does not exist, it's striking how unresponsive interest rates are to even very large swings in prices.

One striking example of this is the US Civil War period, as described by Homer and Sylla in their *A History of Interest Rates*.[9] Contemporary estimates of inflation in the Union during 1863–1864 are on the order of 25 percent. Yet there was no increase whatsoever in nominal interest rates. Railroad bonds issued in those years yielded under 5 percent, compared

with 6 percent before the war; yields on federal and municipal bonds similarly declined. Conversely during the fifteen years after the war, prices were falling on the order of 5 percent per year. If “real” interest rates were primary and nominal rates just their appearance, one might have expected nominal interest rates to have been on the order of 5 percent lower than in the prewar period, when prices had been stable or gradually rising. But in fact, nominal interest rates were essentially the same during the periods before and after the war.

In general, if the fundamental thing is the “real,” intertemporal interest rate, then we would expect to see nominal interest rates bounce around wildly in periods of rapid price level changes, while the inflation-adjusted rate would be roughly constant. But when inflation-adjusted rates are retrospectively calculated for periods prior to the start of active central bank management in the mid-twentieth century, the result is invariably the opposite. Nominal rates are very stable over long periods, while the inflation-adjusted rates fluctuate wildly.

Liquidity as an Institution

While the vision of interest as the price of liquidity is one of Keynes’s fundamental contributions, it must be admitted that the presentation of it in *The General Theory* is rather confusing, and more than a little confused. One problem is that Keynes conflates the general desire for flexibility with the fear of capital loss on existing assets, as two aspects of the same basic phenomenon. We will talk about this problem in the next section. For now, we want to focus on another problem: his identification of liquidity in general with a specific asset called money.

When the idea of liquidity is first introduced in chapter 9 of *The General Theory*, it is described in generic terms as flexibility “to meet emergencies, difficulties, and depressions.”[10] The same general definition is in use in chapter 12, the famous chapter on long-term expectations, which brings in the idea of fundamental uncertainty. Liquidity is discussed there as a principle that guides (undesirably, in Keynes’s view) the organization of financial systems, which are structured to allow maximum flexibility in swapping one asset for another. The term here is used as a description of investment markets as a whole, rather than of a particular asset. But in chapter 13, liquidity preference is redefined much more narrowly, as the

share of wealth that someone "will wish to retain in the form of money." When he refers to liquidity, Keynes now writes, "The subject is substantially the same as . . . the demand for money."[11] The definition of liquidity as money specifically is retained as Keynes formalizes his argument.

This is true especially in chapter 17, on the "Essential Properties of Interest and Money," which modern readers, in our view, might do better to skip.[12] Keynes builds his argument there from the idea that money is a unique asset with zero elasticity of production, meaning that "cannot be readily produced . . . by entrepreneurs." It also has a zero or near-zero elasticity of substitution, "which means that as the exchange value of money rises there is no tendency to substitute some other factor for it."[13] The claim that neither money nor substitutes for it can be produced is another way of saying that money is *exogenous*—fixed by the authorities or by gold reserves or equivalent.

The fact that Keynes is apparently committed to a strong version of exogenous money will be surprising to readers familiar with contemporary Keynesian economics, for which the fact that money is endogenously produced by the banking system is something of a touchstone. What is especially curious about these strong claims in chapter 17 is the simultaneous acknowledgment that the qualities he ascribes to money are possessed by many assets to different degrees. In a footnote Keynes acknowledges that the line between money and other assets is an arbitrary one: "We can draw the line between money and debts at whatever point is most convenient for handling a particular problem. For example, we can treat as money any command over general purchasing power that the owner has not parted with for a period in excess of three months, and as debt what cannot be recovered for a longer period than this."[14] This is entirely reasonable, on its own. But it is hard to reconcile with the insistence that money has a zero elasticity of production and of substitution. Entrepreneurs are certainly capable of producing short-term debt contracts! And an asset with a maturity of four months, which is not money by Keynes's definition above, is presumably a pretty close substitute for a similar asset with a maturity of three months. The generation of more liquid (or seemingly more liquid) assets in response to demand for them is one of the central themes of financial history—as Keynes, in other contexts, was well aware.

The chapter 17 story also focuses exclusively on the rate of interest as a quantitative phenomenon, rather than seeing it—like modern Post Keynesians, as well as astute mainstream observers of the financial system like Ben Bernanke, do—as a surrogate for the general availability of credit. Surveys of business executives suggest that interest rates as such play little role in investment decisions.[15] If finance influences real activity—and there is no question it does—it is largely through changes in who can get credit at all, for what purposes, and how much. But these kinds of credit constraints are hard to fit into Keynes's story in *The General Theory*.

In a 1937 article published in response to the first round of responses to *The General Theory*, we see the same tension. There he offers his widely quoted definition of fundamental uncertainty, as opposed to mere risk:

> By "uncertain" knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is . . . the expectation of life. . . . Even the weather is only moderately uncertain. The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know.[16]

Keynes follows this distinction by describing various devices that people use to make forward-looking decisions in the face of fundamental uncertainty—the various "pretty, polite techniques which [try] to deal with the present by abstracting from the fact that we know very little about the future." The holding of money, he continues, is one among these techniques: "Partly on reasonable and partly on instinctive grounds, our desire to hold Money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future. . . . The possession of actual money lulls our disquietude; and the premium which we require to make us part with money is the measure of the degree of our disquietude."[17] The argument itself is profound and important. The problem comes when a desire for money goes from one

possible example of the operation of liquidity preference, to being identical with it.

It's a real puzzle why Keynes reduces the deep problems of decision-making in an uncertain world, and all the ways they play out through the financial system, to demand for a fixed stock of money. It's especially puzzling since Keynes in his earlier writings, particularly in *A Treatise on Money*, had developed a much richer picture of how trade-offs between income and flexibility play out throughout the financial system. (He returned to this broader perspective in his handful of post–*General Theory* writings on the topic, like the article quoted above—which, unlike the discussion in *The General Theory* itself, describes the interest rate in terms of the choices of banks.) It's also puzzling because, in the *Treatise* and elsewhere, Keynes had earlier stressed that money could not be thought of as a quantity, but as an abstract unit of account, which was concretely manifested in various systems of recordkeeping.

Thoughtful Keynes scholars continue to struggle with the inconsistency between Keynes's assumption of a fixed money stock in the analysis in chapter 17 and elsewhere in *The General Theory*, and his careful analysis of the independent role of the banking system in expanding means of payment in his writing elsewhere. The economist Joerg Bibow describes endogenous, bank-created money as the "Pandora's box kept shut" in *The General Theory*.[18] Bibow argues that shifting to an exogenous money perspective was a tactical choice, intended to simplify the argument and focus attention on the then-revolutionary principle of effective demand. The original contribution of *The General Theory*, in this telling, was to show how the interplay of income and spending could create instability and depressions on its own, even in the absence of disturbances from the financial system. Given that Keynes wanted to "concentrate on the income-expenditure part" of the argument, asks Bibow rhetorically, "Why complicate matters by making allowance for banks' discretion?" Less charitable readers have seen the chapter as a symptom of Keynes's failure to fully extricate himself from the economic orthodoxy he had been trained in.

Given the impact of the book, it is hard to argue with Keynes's choices, or to blame him for writing for readers in his own day rather than those a hundred years later. Still, the presentation of liquidity in terms of a unique

money asset has obscured its meaning for later generations and laid the groundwork for the idea that the far-reaching problems he identified in capitalism could all be resolved by a central bank following an appropriate monetary rule. In thinking about liquidity today, we will do better to follow the Keynes of chapter 12, rather than chapter 13, and think of it in terms of the network of payments and balance sheet commitments as a whole, rather than as the property of an individual asset.

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Let’s return to the mortgage loan we have been discussing. We said before that while the borrower gets an IOU (the deposit) that can be redeemed or transferred immediately and in full, the bank gets a claim to a future stream of payments that will only be received on specified dates in the future. That, we said, is why the bank’s balance sheet has become less liquid.

This story might be enough for many kinds of loans in many settings, which banks normally hold to maturity. It might well have been true for mortgage lending historically. But it must be complicated considerably for a modern financial system. First, the deposit created by the loan is unlikely to remain on the books of the bank that made it. The house seller (who the deposit is made over to) will normally transfer it to their own bank. Even if they are a customer of the same bank, they will make their own purchases, from businesses that are customers of other banks. If the flow of deposits between banks is not balanced, the difference needs to be balanced by a transfer of some settlement asset.

These settlement assets are typically (though not necessarily) reserves at the central bank, which acts as the trusted third party between banks just as banks do between nonfinancial units. Since banks do not typically keep significant reserves on hand (or at least, did not before 2008) the reserves used for netting out have to be borrowed. Thus the deposits on the liability side of a bank making a large volume of loans will gradually be replaced by loans from other banks. In the era of deposit insurance, deposits are generally regarded as a safe form of financing for banks, despite the notional right to withdraw them at any time. Interbank loans are less so. Households and businesses, in general, do not change their choices about where to hold their deposits very often, or in a way that is particularly sensitive to the financial condition of the bank. (The 2023 run on Silicon

Valley Bank raised questions about this conventional wisdom, however.) The relevant point for our purposes is that liquidity and illiquidity must be seen not as properties of individual assets (or liabilities) in isolation, but of balance sheets as a whole, and the institutions they are embedded in.

Meanwhile, the bank does not need to wait for the mortgage payments to be made at the scheduled time. It can transfer the mortgage to a third party, in effect trading off some of the income it expected for a more liquid position. The buyer might be some other financial institution looking for a position farther toward the income end of the liquidity-income trade-off, or, perhaps, a central bank. (During the financial crisis of 2008, the Fed acquired over a trillion dollars of mortgages in the United States.) To the extent that increased lending puts upward pressure on interest rates, it is because it requires that someone in the financial system accept a less liquid balance sheet position. But who that is, and the extent of the increased illiquidity, is not straightforward. Great expansions of credit typically come when some institutional innovation reduces the marginal illiquidity of additional lending.

Mortgage-backed securities are among the most widely traded assets in the world. In many situations, they are easy to get rid of from the balance sheet of banks. But not always. During the global financial crisis of 2007–2009, it became impossible to do so without reducing the price significantly, or in some cases at all. The extent to which an instrument is shiftable is evidently a function of the whole network of relationships between institutions.

Similarly, in modern financial systems, “deposits” is a placeholder for any instrument that allows firms and households to meet their monetary obligations. Continuous liquid money markets mean that many instruments can be used as settlement between large players. Rather than themselves taking the illiquid positions—the fixed, long-term commitments—that offset the liquidity required by the nonfinancial economy, banks can pass that on to other institutions.

The function of flexibility has been played increasingly by capital markets over the last three decades. Both for firms and for financial institutions, obtaining liquidity through capital and money markets can be cheaper and quicker than accessing traditional banks with their central bank backstop. The center of gravity of liquidity management is now the

“shadow banking” system. In the last two decades, especially in the US and Europe, liquidity for longer-term investment has been provided by the private money market, by a large complex of private-sector balance sheets that have engaged in bank-like liquidity transformation, but that are not traditional banks. Where the mortgage example above relies on the ability of a single bank to expand its balance sheet in order for the couple to procure their house, in modern systems, it is a complex of balance sheets and instruments that end up allowing for this. As the financial economist Zoltan Pozsar and his coauthors put it: “Like the traditional banking system, the shadow banking system conducts credit intermediation. However, unlike the traditional banking system, where credit intermediation is performed ‘under one roof’—that of a bank—in the shadow banking system, it is performed through a daisy-chain of nonbank financial intermediaries in a multi step process.”[19] When the “public desires to become more liquid,” in Keynes’s words, there may now be a thick layer of balance sheets between them and the institution that ultimately becomes more illiquid.

Still, at the end of the day, the mortgage has been issued and the house has been bought. In the course of the transaction, both banks and borrowers have lowered their flexibility: The household has acquired a fixed liability and hard-to-sell asset, while someone in the financial system—if perhaps not the originating bank—has acquired a long-term asset and short-term liability. The limit of the process is not real resources or anyone’s willingness to defer consumption—neither the bank nor the household had to. Rather, it is the continued willingness and ability of both sides to make their financial positions more inflexible and brittle, to diminish their margins of safety (Minsky’s term). Safety is understood here in terms of their ability to fulfill their survival constraint (Minsky again)—to ensure that their cash outflows can be met out of their cash inflows. Cash inflows normally come from operation of one’s assets. Larger immediate cashflows can be generated by offloading them—selling position to make position, in another Minskyan phrase. One’s margin of safety—one’s willingness to move further toward the income side of the income-liquidity trade-off—depends then on how easy it is to find buyers for those assets, quickly.

As long as conditions allow for banks to expand their balance sheets, flexibility is maintained for everyone else to expand their activity and change their plans. The banks’ provision of liquidity allows the rest of us to

postpone settlement, to have income less than our obligations and survive another day.

This broader notion of liquidity, it should be noted, is much older than the term itself. In seventeenth-century England, Holland's more advanced banking system was seen as a source of military advantage in the conflicts between the two countries. So, encouraging the growth of banks was in the national interest. To this end, the English engineer Andrew Yarranton proposed the creation of a national system for registering land titles. This would make it much easier for banks to invest in mortgages. And this, argued Yarranton, would allow them to offer greater credit at lower interest rates: "Certainly then the Moneys will be lent at four in the hundred."[20] The vision of the market interest rate as an index of the shiftability of all kinds of assets is a striking anticipation of Keynesian theories of liquidity preference.

The Nonneutrality of Money

The fundamental point in the discussion so far is that insofar as the interest rate is a price, what it is a price of is not "saving" or the willingness to wait, but rather *the capacity to make and accept promises*. There are, at any moment, an endless number of ways some part of society's resources could be reorganized so as to generate greater incomes. You could open a restaurant, or build a house, or get a degree, or write a computer program, or put on a play. The physical resources for these activities are not scarce; the present value of the income they can generate exceeds their costs at any reasonable discount rate. What is scarce is *trust*. You, starting on a project, must exercise a claim on society's resources now; society in turn gets your promise of benefits later. The money view approach to interest rates, one might say, puts the emphasis on "promise," rather than on "later." The hierarchy of money allows participants in various collective projects to substitute trust in a third party for trust in each other. But trust is still the scarce resource.

The relationship between liquidity and trust is more directly visible where finance is less developed. In developed capitalist society, nodes in the financial web can be more or less anonymous. If I want a loan to start a business, the bank will certainly want detailed information on its prospects, and probably collateral of some kind. But they are, usually, uninterested in

my extended family or personal background. And if they say no, I am free to try another bank.

In much of the developing world, the management of cash flow obligations is more personalized. The first stop for credit is relatives and family, rather than the bank. There is less recognition, socially and technologically, of an economic unit as an abstract entity, as distinct from the human beings who make it up. The lending of money is inseparable from other strong ties, and the moral norms that structure them. Loans between individual family members may involve “balanced reciprocity” (a lovely anthropological term suggesting an understanding and obligation of equivalent gift giving between individuals), but these can only go so far. If required payments tap out these aquifers, the next step is often to obtain money, not from a bank, but from informal external sources.

If credit commitments normally bind friends and kinfolk, the professional moneylender in a setting must make an extra effort to show that he is something different. Norms of reciprocity must be broken through violence—threatened or actual. In Peter Lanjouw and Nicholas Stern’s landmark study of the village of Palanpur in Uttar Pradesh, India, Harpal, a veteran moneylender, is asked about the profitability of moneylending.[21] He replies “dandewale ko faida hai,” that is, “it is profitable for those who enforce their authority with the stick.” The description of another moneylender is equally grim. “Vishnu Dutt is known for his ruthlessness, and is even said to have committed at least one murder. Any borrower who dared to resist his pressures to repay would be exposing himself or herself to serious physical harm.” In Hindu mythology, Yama is the god of death. He is also the keeper of obligations.

The moneylender example illustrates a fundamental conflict in credit transactions. Each unit wishes to be able to maneuver out of financial positions and obligations—to maintain a certain flexibility of action. At the same time, each unit wishes for rigid commitments from others. The lender wants to be paid back on time and in full, the borrower wants forbearance. The resolution comes through the exercise of power, whether it is through the stick, or the workings of more formal courts and laws.

For a smaller scale society, almost definitionally, the world of credit and money is personalized and particular; relaxing the survival constraint in one context involves the creation of binding obligations to some particular

person. Easier or more difficult access to money, in such a context, implies a loosening or tightening not just of credit conditions, but of hierarchical relationships of all kinds.

This is most visible in the debtor revolts that are a ubiquitous feature of incompletely monetized societies. The occasion for Shay's Rebellion, the biggest violent challenge to the authority of the newly formed government in the newly formed United States, was precisely the insistence that debts and other obligations be settled in cash rather than through new debt. This financial tightening was not a narrowly economic problem. It threatened the independence of small farmers and strengthened the advantage of the handful of wealthy landowners and merchants who had access to currency.[22]

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In modern contexts, the availability of money plays out in less dramatic but equally far-reaching ways. Easier access to money does not just allow people to spend more. It changes the kind of spending that is worthwhile.

In a world in which production is organized through extensive, ongoing structures of cooperation and makes use of long-lived means of production, the fundamental constraint on productive activity is not real resources but the capacity to make promises.

The system of commitments expands when new promises are made and new money is created; when the day of settlement comes, the system contracts as the open commitments close again, all on invisible balance sheets. It is a kind of metabolism or respiration, working at the time span of seconds, minutes, days, years, and the lifespan of empires, depending on which set of commitments one is observing.

The future is unknown; it depends on choices being made today. But those choices depend on, not only beliefs, but commitments about that future. Each debt-financed transaction is, in effect, a bridge being built into an unknown void; whether there turns out to be another side depends on the bridges being built by everyone else. One is reminded of Whitman's spider:

> [I] mark'd how to explore the vacant vast surrounding,
> It launch'd forth filament, filament, filament, out of itself,

Ever unreeling them, ever tirelessly speeding them.

. . . . . .

Surrounded, detached, in measureless oceans of space,

Ceaselessly musing, venturing, throwing, seeking the spheres to connect them,

Till the bridge you will need be form’d, till the ductile anchor hold,

Till the gossamer thread you fling catch somewhere. . . .[23]

Launching filaments into the void is as tricky a business for finance as for spiders. It entails both a separation from solid ground and an attachment to it that ultimately halts your flight. The fundamental trade-off in the financial system is this tension between flight and attachment—between flexibility and stability.

Earlier, we suggested that in a world of pure commodity money, money might be neutral, in the sense that an increase in the quantity of money would cause all prices to rise leaving relative prices (including, we stressed there, the interest rate) the same as they were before. But even this is conceding too much. Even if we think of money as a unique asset in fixed supply, used only for purchases of goods and services, the amount of money that must be held will depend on the kind of thing that is being purchased.

The British economist (and early interpreter of Keynes) John Hicks suggests a simple example.[24] Imagine someone who buys a newspaper every day at the newsstand. If they have more money on hand, they might well decide to spend more on newspapers, but this will not necessarily be a simple matter of buying another at the stand. If you’re less worried about having enough cash, getting a subscription becomes more attractive. It’s a bigger commitment upfront, hence unappealing if you’re worried about paying next week’s bills. But it has the convenience of home delivery and is presumably cheaper (equivalent to a higher income). Similarly, in a world where cash is scarce and loans are hard to come by, the newspaper vendor is unlikely to take a chance on carrying any but the surest-selling titles. If money is more abundant, they are more likely to. Abundant money does not just lead people to pay more for the same goods. It shifts their spending toward things that require big upfront payments and long-term

commitments, and that are riskier. Minsky's version of the story emphasizes that we have to think about money in terms of two prices, current production and long-lived assets. Long-lived assets must be financed—acquiring one typically requires committing to a series of future payments on a loan or bond. So their price is sensitive to the availability of money. An increase in the money supply does not raise all prices in unison, but disproportionately raises the price of long-lived assets, encouraging production of them. And it is long-lived assets that are the basis of modern industrial production.

A parallel argument was made by Piero Sraffa in *Production of Commodities by Means of Commodities*, published some thirty years after the debate with Hayek we mentioned earlier.[25] This brief, austere book remains one of the more treacherous rocks in the stream of economic theory; whirlpools of debate continue to swirl around it. But here is one conclusion we might take from it.

Start from the same single-commodity world we discussed earlier but add the possibility of using the corn to make long-lived capital goods. In this world, people have the choice of producing corn with relatively more labor or more capital. Which technique they choose will, presumably, depend on which is the lowest cost one. The cost of capital goods is the labor that went into them in the past. But to value that past labor, we need a discount rate, a way of valuing past and future labor relative to current labor. But it's precisely this discount rate that the model is supposed to provide!

What Sraffa shows, then, is that we cannot even measure capital unless we already know the rate of interest (or equivalently, profit). So this must be given from outside the system. This rate may, he suggests, be determined by the financial system, and "in particular by the level of the money rates of interest."[26] As has been stressed by Sraffa's followers, this creates a problem for the idea that values are determined by the labor required for production, and that interest comes afterward as a claim on the surplus. If Sraffa is right—and his logic seems irrefutable—we can't know how much labor is required for production unless we already know the interest rate.

Knut Wicksell, who we earlier credited (or blamed) for the idea of a natural rate of interest, was well aware of this problem. Like Sraffa, Joan Robinson, and their fellow Cambridge Keynesians, Wicksell saw it as a fatal flaw in attempts to derive the distribution of income between labor and

capital from the same marginalist principles as were used to explain the relative prices of commodities. In his view, “it is futile to attempt . . . to derive the value of capital goods from their cost of production . . . for, in fact, these costs of production include capital and interest. . . . We should, therefore, be arguing in a circle.”[27]

In Robinson’s debates with Paul Samuelson and his colleagues in Cambridge, Massachusetts, the central conclusion was that you cannot derive the distribution of income between classes in the same way as the relative prices of different commodities. For our purposes here, the key point is a bit different. It is that the relative value of capital goods, and the choice between more and less capital-intensive production techniques, depends on the rate of interest. Capital goods—and the corporations and other long-lived entities that make use of them—are by their nature illiquid. The willingness of wealth owners to commit their wealth to these forms depends, therefore, on the availability of liquidity. We cannot analyze conditions of production in nonmonetary terms first and then afterward add money and interest to the story. Conditions of production themselves depend fundamentally on the network of money payments and commitments that structure them, and how flexible it is.

Sraffa and Wicksell focused on the time dimension—the availability of liquidity, and the money rate of interest that expresses it, determining how worthwhile it is to invest in long-lived means of production. Another question is the scale of production. Sraffa explicitly assumed constant returns—producing two goods requires exactly twice as many inputs as producing one.[28] But in the real world, many forms of production show increasing returns—as the scale of production rises, the cost of each additional unit of output falls. This creates another route for money to have real effects, since it is often financing conditions that determine the maximum scale an enterprise can reach.

This was emphasized by Michal Kalecki, another icon of Cambridge Keynesianism. Kalecki is best known today for his argument that a program of full employment would be resisted by business owners, who understand that their authority rests on the threat of unemployment.[29] But in his more strictly economics work, an important premise was that the scale of production is dictated by the financial resources available to business owners rather than by technical factors.

The nonneutrality of money in this sense is very evident in the modern world. Investment in new forms of production can drastically bring down their costs. The cost of solar voltaic cells, for example, fell by over 80 percent between 2010 and 2020—far faster than anyone had predicted. This fall in costs was mainly, if not entirely, due to the increased scale of production. And this increased production would not have happened without abundant (and publicly subsidized and guaranteed) financing.

This kind of outcome is not automatic. Merely making money more available will not guarantee an expansion of productive capabilities—as critics of financial panaceas often warn. The essential point, though, is that money and credit are technologies for making promises. They are tools to allow commitments between people beyond the limited range of existing social ties. Modern production, with its vast division of labor and highly specialized tools and techniques, is immensely commitment hungry. Its scope for expansion depends on the availability of money.

Asset Prices and Convention

The interest rate, we have argued so far, is the price of money—or more precisely, the price of being able to make money commitments. If you want to increase the range of money payments you can make, you must sacrifice some of your expected income to do so; that is what it means to borrow. If you can commit to making money payments to someone else at a time of their choosing, you can receive an income for this; this is what it means to lend. Interest—and the broader constellation of fees, covenants, credit ratings, and so on that it represents—is a premium one pays in order to exercise a claim on real resources today by making a promise of payment in the future.

So far, so good. But, as we said at the beginning, it’s important to focus on the real sites where interest appears. One of those is the market for new loans, like the hypothetical mortgage transaction we began with. But in reality, new loans are only a small part of interest’s natural habitat.

A payment for which I incur a debt need not be in return for real resources or direct claims on anyone’s labor. Loans are most often incurred to take possession of existing assets—including financial assets. Loans may also be incurred to finance payment of existing money obligations,

including service on past debt. This is the normal function of borrowing by national governments and is common for many other kinds of units, including households in the aggregate. The bulk of the payment financed by a home mortgage goes to pay off the seller's mortgage.

And on the other side, my promise once made becomes an asset in its own right, which can be transferred to a third party and acquire its own market price. The creditor of a debt contract need not be the entity that originally entered into it. Almost all bonds and many loans trade in secondary markets, changing hands repeatedly before reaching maturity, and being repriced in each sale. The volume of these transactions dwarfs that of new lending. This means that it's in this secondary market that we should really think of the interest rate as being determined. A bank issuing a mortgage must pay careful attention to the secondary market in which it can be resold; the buyer of a securitized mortgage need not—and in practice never does—weigh the price against the alternative of issuing a new mortgage itself.

This brings us to Keynes's third big idea about interest. (The adjustment of output to balance savings and investment was the first, liquidity preference was the second.) To the extent that the interest rate is a market outcome, it is, in economists' terms, a stock equilibrium, not a flow equilibrium. It is the price that leaves bond owners willing to hold the debt already in existence.

While we typically focus on the interest rate as the terms agreed to by the parties to a new credit agreement, the interest rate is really set in the much larger market for existing debt contracts. These contracts are a specific kind of asset. They give the holder a claim on specified future payments from the debtor, yes, but the asset itself has its own existence. This may seem like a trivial point, but it has far-reaching consequences—it means that the market for credit assets, which is where the interest rate is actually set, cannot always be understood as a hypothetical swap of payments today for payments later. This makes interest rates in the real world quite different from those of economic theory.

Asset Prices, Not Interest?

It is natural to begin a discussion of interest rates, as we did, with the conditions on which new loans are made. But the markets in which interest

rates are determined, and where their effects are felt most directly, are in the markets for *existing* loans and other assets. For some of Keynes's followers, this was his most important idea about interest. Hyman Minsky, for example, argued that "the General Theory should have been titled the General Theory of Employment, *Asset Prices* and Money. . . . the liquidity preference theory of interest is really a theory of the determination of asset prices in a capitalist economy."[30]

For orthodox economists, money is neutral, a transparent window into the terms on which real goods trade for other real goods. For Minsky, on the other hand, "money is *not* neutral because money affects absolute and relative asset prices and the pace of investment, whereas wages and profits (which are determined by investment) yield absolute and relative output prices" (emphasis added). There is a clear causal sequence here from liquidity, to asset prices, to investment spending, to employment and income. Interest rates as such are not part of the story—or rather, they are just one aspect of asset prices.

Minsky's contemporary Kenneth Boulding made a similar point even more forcefully, rejecting the idea that "the interest rate" is a meaningful economic quantity at all. Boulding is little known today, but his thoughts on this question are worth quoting at length:

> Much work on the theory of interest is hampered at the start by its unquestioned assumption that "the" rate of interest, or even some complex of rates, is a suitable parameter for use in the construction of systems of economic relationships. . . . The rate of interest is not a "price"; its dimensions are those of a rate of growth, not of a ratio of exchange, even though it is sometimes carelessly spoken of as a "price of loanable funds." What is determined in the market is not strictly the rate of interest but the price of certain "property rights." . . . Each of these property rights represents to an individual an expected series of future values. . . . If this expected series of values can be given some "certainty equivalent" . . . then the market price of the property determines a rate of interest on the investment. This rate of interest, however, is essentially subjective and depends on the expectations of the individual; the objective phenomenon is the present market price.[31]

In other words, while it is convenient to speak of “the interest rate,” we never actually see money today trade for money tomorrow. All actual economic transactions take place in the present. What we see is money today traded for an asset today. Yes, that asset conveys a *promise* of money tomorrow. But it necessarily also has other concrete characteristics. There are legal terms governing its execution and what happens in the event of default, additional rights granted to one or both parties (like the various covenants typically attached to corporate debt, or the right of prepayment for a residential mortgage), which may or may not result in the stipulated payments being made, and it may be more or less easily resold or borrowed against by the creditor. This means that the price of the asset can change, independent of the flow of money payments it promises, and this fact itself is an additional factor in its price.

A striking example of this phenomenon is the difference in price between “on the run” and “off the run” Treasury bonds. An on-the-run security is one from the most recent offering of that maturity, while an off-the-run security is one from an earlier offering. It’s a long-standing, though somewhat puzzling, feature of Treasury markets that on-the-run securities consistently carry a premium relative to off-the-run ones. A ten-year bond issued five years ago, for example, has five years of payments remaining, which will be made on the exact same schedule and with the exact same (near-zero) risk as a five-year bond issued today. Yet the new, on-the-run bond consistently trades at a higher price than the old one. Or equivalently, the off-the-run bond trades at a higher yield. Admittedly this spread is usually small, between 10 and 20 basis points (or 0.1 to 0.2 percentage points), though it was briefly as high as 60 basis points in 2008.[32]

Why would rational, sophisticated bond traders pay different amounts for identical streams of future payments?

The answer is that they are not buying a stream of future payments. They are buying an asset. An old ten-year bond is not the same asset as a new five-year bond, even if the promised future payments are exactly the same. An order to buy a ten-year bond must be fulfilled by delivery of a ten-year bond, not by delivery of a twenty-year bond with ten years still to run. And since there are many more orders for newly issued bonds, they are easier to sell, or more liquid, and hence more valuable—or at least, this is the most

common explanation for the on-the-run premium. This would explain why the spread was larger in 2008—a crisis is when liquidity is most valuable.

A similar anomaly existed in the nineteenth-century market for British government debt, then the most important security in the world. Starting in the mid-eighteenth century, the British government had issued perpetuities—bonds with no fixed maturity date that could pay interest forever. The largest category of these were "consols," which had initially been issued to replace (or "consolidate") higher-yielding existing debt. At times, however, the British government issued other perpetuities as well. These other issues, although offering the same future payment streams from the same government, typically traded at a substantial discount to consols or, equivalently, carried a higher yield. The price difference was often £1 or more for a security with a face value of £100. Thus, in effect, investors would pay £101 for the British government's promise of £3 a year if the promise was called a consol, and only £100 for the same promise from the same government if it was called something else. *The Economist*, which periodically noted this anomaly, in an 1861 article suggested an explanation for it: "Saleability—ready, easy, satisfactory saleability—is the great quality which a good security should possess. . . . This is the cause of the great partiality in the money market for Consols. . . . It is half a proverb that 'you can sell Consols on a Sunday.'"[33]

It might be tempting to assume we can abstract away from these details—we are talking about interest rate differences measured in tenths of a percent. But that would be abstracting away from the basis of interest in the first place. The "saleability" of consols is precisely the quality for which interest is paid.

Interest is paid precisely because it is not possible to contract directly about future developments. If the future were known with certainty (or its stochastic equivalent) and contracts were always fulfilled, there would be no such thing as credit—future goods could be traded directly against present ones. But this is impossible. The future does not exist; exchange is possible only in the present. So the best one can do is acquire an asset, today, which one believes will give a claim on the stuff one wants in the future. This might be a direct claim, like the deed to the house that one likes to live in. But in the case of a financial asset, the claim on goods (or more usually, other assets) in the future, or the satisfaction of future obligations,

will normally be exercised by selling the asset. Interest is paid in compensation for holding an asset whose sale terms are less certain. The premium for on-the-run bonds or for consols, then, should not be seen as a weird deviation from normal interest rate determination. It should be seen as a pure example of exactly what the interest rate is—the premium for a more liquid relative to a less liquid asset.

This phenomenon is usually not as clear-cut as it is in the Treasury bond market. But liquidity premiums exist for all kinds of assets. The journalist Felix Salmon, for example, once observed that many of the world's highest-priced artworks were parts of series.[34] The world's two most expensive sculptures, as of this writing (early 2023), are Giacometti's *L'Homme au doigt* and *L'Homme qui marche*, both of which were produced in sets of half a dozen identical copies. So was Jeff Koons's *Rabbit*, currently number four on the list. Many of the world's most expensive paintings, including Munch's *The Scream* and Cézanne's *The Card Players*, were similarly parts of series—not to speak of immensely successful artists like Warhol or Damien Hirst, whose work is defined by repetition. This might seem surprising, since one would think that uniqueness is part of what makes artworks command high prices. But as Salmon points out, it's not really so strange—the fact that other collectors or high-profile institutions have paid for the identical work both validates the high price and makes it more likely that it can be resold. Monumental bronze sculptures are not much like Treasury bonds in most ways. But the same fundamental principle is at work in both cases: Ownership rights over a thing are distinct from the thing itself and may be valued quite differently—in particular by the ease with which they can be transferred to someone else.

Several important implications follow from the fact that what actually exists is not interest rates, but market prices for assets. First, we can't make an analytic distinction between "the" interest rate and the spreads between different rates; the same factors determine both the absolute level of the interest rate and the spreads between various rates. Second, the conditions that influence interest rates depend not only on the characteristics of the borrower, but also on the market in which their debt is traded. Third, the return on a debt for the owner of it depends not only on its yield but on the change in market prices during the time it is held. One critical aspect of this is the conventional nature of asset pricing. In a very real sense, interest rates may be high because they are high, or low because they are low.

We will return to the diversity of interest rates later on. But first, we will consider the conventional nature of asset prices and interest rates.

Convention and the Liquidity Trap

An important implication of interest as the price of an asset, not future income as such, is that the price of an asset can change. The payments the debtor will make are written into the legal contract that constitutes the loan. But the market value of those future payments can be constantly reevaluated. When interest rates rise, prices of existing bonds fall—the two are equivalent. (Boulding would remind us that "interest rates rise" is just another way of saying "bond prices fall.") If the holder of a bond wishes to sell it before it matures (or if they have to record changes in the value of their assets for accounting or regulatory purposes) then the rise in interest rates results in a capital loss for holders of existing bonds. Similarly, a fall in interest rates results in a capital gain.

The risks of holding a bond, in other words, are not just that you won't have access to means of payment when you need it, or that the borrower will default; it is also the capital loss you will suffer if interest rates rise while you are holding the bond. This has two further implications. First, the risk for which interest is paid in compensation is not just illiquidity—that the asset is less suitable than cash for making immediate payments; it is also compensation for the risk that the price of the asset itself may change. Second, it means that expectations about the future price of bonds are a critical element in the price of bonds today, which gives interest rates, especially longer ones, a circular, self-confirming, or conventional character.

For longer bonds, the change in the price of the bond is roughly inverse to the change in the interest rate. In other words, if the market interest rate on that type of bond falls from 4 percent to 3 percent, the price of the bonds will rise by one-quarter. If it rises back to 4 percent, the market price will return to its old level, a rise of one-third.[35] For someone who plans to hold the bond to maturity, this doesn't matter. But in modern financial markets, where the holding period for a bond is typically much shorter than the bond's length, and where even entities that don't sell their bond holdings may need to regularly mark them to market value, it can matter a lot. In effect, the buyer of a bond needs to consider not only how much it yields

relative to other assets, but how much its price is likely to change over the time it is held.

For example, suppose you buy a thirty-year bond with a face value of $1,000 and a coupon (or annual payment) of $60. This is the same as saying the interest rate on the bond is 6 percent. Now suppose the prevailing interest rate on this type of bond rises by 1 point to 7 percent. Since the coupon payments are still $60, that means the value of the bond must now be $876, so you've suffered a capital loss of approximately 12 percent. If the bond's initial interest rate was 3 percent, on the other hand, a 1-point rise to 4 percent implies a capital loss of 17 percent. The possibility of this happening will obviously be a factor in your willingness to buy the bond. And it will be a bigger factor in the second case than in the first, since the potential capital losses or gains are so much larger than the income that the bond yields.

Different assets can have different conventional values. Suppose you buy an asset with an eye on its future market value—your investment horizon, in other words, is short relative to the asset's duration. Then you have to think about what the price of *this* particular asset will be in the future. This means that arbitrage conditions that would hold if assets were just streams of future payments can fail badly in practice.

In particular, there can be large and persistent deviations between longer and shorter rates. These deviations are a well-known anomaly in the empirical finance literature. The "expectations hypothesis" says that the interest rate on longer bonds should just be the expected average interest rate on short bonds over the same period so that there is no particular possibility of arbitrage. But generations of researchers have found that long and short rates seem to stubbornly go their own ways.[36] The consensus of this literature is that the expectations hypothesis "simply fails empirically."[37]

The aspect of this non-arbitrage that most concerned Keynes was the failure of long interest rates to fall even when demand for new loans was very low. In this story, the convention-imposed floor on longer interest rate was a, arguably even *the*, major obstacle to full employment in capitalist economies. As he put it in *The General Theory*, "the most stable, and the least easily shifted, element in our contemporary economy has been hitherto, and may prove to be in future, the minimum rate of interest

acceptable to the generality of wealth-owners," adding in a footnote a line from Bagehot: "John Bull can stand many things, but he cannot stand two percent."[38]

This aspect of Keynes's thinking is obscured in much of the postwar Keynesian consensus, which tried to incorporate a case for demand management into a nonmonetary real-exchange framework. But for many writers in the more radical Keynesian tradition, it is central. Leijonhufvud, for example, describes a key feature of the Keynesian vision as a secular tendency of profits from investment to decline faster than conventional interest rates can keep up with, leaving interest rates chronically too high for full employment.[39] As Leijonhufvud emphasizes, the failure of the interest rate to fall enough to deliver investment high enough to reach full employment comes directly from the fact that it is set in asset markets with an eye on capital gains or losses.

This effect is strongest at low interest rates, not only because bondholders are getting very little yield to compensate them for the possibility of capital loss if rates rise, but because a rise in rates will probably seem more likely. (Keynes overstated the case by assuming that interest rates could not fall below zero. As we now know, they can.) In the case of the thirty-year bond discussed above, if you thought there was even a one-in-five chance that rates would rise from 3 to 4 percent in the next year, you would rather hold cash, which yields nothing, than hold the bond. And if no one will hold the bond at an interest rate of 3 percent, then the interest rate cannot fall to 3 percent. (Again, the interest rate is just another way of expressing the market price of the bond.) This means that if there is a widely held view about the normal or usual level of long interest rates, this view will effectively serve as a floor under the actual level of interest rates. And if interest rates never seem to fall below a certain level, that will strengthen the belief that they cannot fall below that level—which will make it even less likely that they will.

It is this dynamic, and not a zero lower bound on interest rates, that was the basis of Keynes's original description of what has come to be known as the liquidity trap:[40]

> Circumstances can develop in which even a large increase in the quantity of money may exert a comparatively small influence on the

> rate of interest. For . . . opinion about the future of the rate of interest may be so unanimous that a small [decrease] in present rates may cause a mass movement into cash. It is interesting that the stability of the system and its sensitiveness to changes in the quantity of money should be so dependent on the existence of a variety of opinion about what is uncertain. Best of all that we should know the future. But if not, then, if we are to control the activity of the economic system by changing the quantity of money, it is important that opinions should differ.[41]

In other words, the essence of the liquidity trap is a widely shared convention about the normal level of interest rates. If all bond market participants believe that interest rates on a particular class of bond cannot be below 3 percent, say, for any extended period of time, then anyone who finds themselves holding a bond yielding less than 3 percent will expect a capital loss when rates return to that level, and will be anxious to sell it. And their efforts to do so will push the price of the bonds down, which itself will increase their yield back toward 3 percent, so that the market participants who did not share the conventional view are the ones who end up suffering the loss.

Are Convention and Liquidity Preference the Same?

In the orthodox view, there is a single interest rate. The various market rates are based on this plus added risk premiums, primarily reflecting the probability of default. The interest rate itself may be a real intertemporal trade-off, or a policy variable set (somehow) by the central bank. (Or you can square the circle with the use of "natural" rate that the actual one may depart from.) In our Keynes-derived telling, on the other hand, the interest rate is a fundamentally monetary variable, which cannot be derived from a hypothetical nonmonetary system of exchange. To the extent that it is a price, what is being priced is our limited knowledge of the future (not just a statistical default risk) and our limited capacity to make promises.

Two different ways of thinking about the interest rate come from this. First, liquidity: Transferring monetary commitments changes the degree of flexibility the units involved will have in making money payments in the future. Second, convention: A debt contract is not merely a placeholder for

a stream of future payments but an asset in its own right, with its own distinct properties including a market price that may change. We might wonder what the relationship is between the two.

A number of answers are possible. Liquidity is evidently a more general concept: It is potentially relevant to any kind of economic decision-making, while convention is specific to speculative asset markets—those where the future price of the asset is an important consideration relative to its usefulness or the income it generates. Unless an asset is at least somewhat liquid in the exchangeability sense, expectations of its future price are unlikely to be important compared with whatever benefits ownership of the asset provides. Even within asset markets, convention becomes more important for longer-lived assets.

People may take possession of assets for all sorts of reasons related to the way that particular asset supports their own distinct activities. A family buys a house to live in it; a landlord buys it to rent it out. But to the extent the position is a financial one, motivated only by money return, then as the duration of the asset grows longer relative to the investment horizon, the big question becomes the self-referential "What is a reasonable price for this kind of asset?" Finally, conventional pricing is a story about a particular asset. Liquidity in the sense of shiftability or exchangeability is also often used in this way. But liquidity in the more general sense of one's ability to make unexpected payments is a property of the balance sheet as a whole. Thinking of liquidity in this way may lead to quite different conclusions than when one thinks of it in terms of an individual asset.

Keynes deserves the credit he gets for introducing the concept of liquidity in the language of economics, and for emphasizing the importance of fundamental uncertainty, as opposed to statistical risk. But his presentation of it leaves much to be desired. Earlier, we criticized *The General Theory* for reducing liquidity preference to money demand. But there are two further distinctions which are also obscured there, lying, so to speak, on either side of the liquidity-money dyad.

On the one side, there is the conflation of uncertainty as such with liquidity preference. Keeping one's options open is not the only possible response to an awareness that the future is unknown. What makes the future uncertain, fundamentally, is that other people have choices about it. One way of mitigating uncertainty is to keep your own choices flexible, so

things will be OK for you regardless of what others decide to do. But another way is to try to nail down the choices of other people. You can mitigate uncertainty by getting control over the outcomes you care most about. Don't put all your eggs in one basket is sometimes good advice. But other times, it's wiser to have just one basket, and take very good care of it.

On the other side of the liquidity-money dyad, there is the further reduction of money demand to fear of capital loss on longer assets. In the article quoted earlier, Keynes describes the desire for money as a fundamental psychological response to the unknowability of the future, one that "operates, so to speak, at a deeper level of our motivation."[42] But this is not how he talks about it in chapter 15 of *The General Theory*. There, the unknowability that matters is not the prospect of a general war or the social position of wealth owners, but future bond prices specifically: "Uncertainty as to the future course of the rate of interest is the sole intelligible explanation of . . . liquidity-preference."[43]

Keynes's derivation of interest from uncertainty, it seems to us, involves four successive stages, with a narrowing of scope at each one. We start with the foundational epistemological fact of a future that cannot be known, even statistically. (This was a concern of Keynes since his early writings on probability.) In a society like ours, one organized through webs of money payments and commitments, a natural response to this basic fact is to structure one's balance sheet so as to retain the maximum flexibility to make whatever payments one may need or wish to make in unexpected contingencies. This second step is liquidity preference. One way of achieving this flexibility is to own assets that can themselves be directly used to make payments, or that can be readily converted into means of payment, even if these assets yield less income than alternatives. We may simplify this to a choice between "money" and "bonds." This is the third step. Finally, we may consider this trade-off solely in terms of the danger that the value of the bonds may fall during the holding period. This fourth step gets us the version of the argument most fully developed by Keynes and makes liquidity preference and conventional bond pricing equivalent.

There is nothing wrong with this path. But at each stage, different turns might have been taken. Keeping your options open is certainly one common response to uncertainty. But avoiding commitment is not always possible, or desirable. Antonio may rest easy because "My ventures are not in one

bottom trusted / Nor to one place."[44] But Portia cannot relieve her worries that way; she must choose a single suitor. Nor is maintaining flexibility only a matter of your financial position. Insofar as liquidity *is* a matter of balance sheet positions, it involves liabilities as well as assets. Jean Tirole, one of the small number of mainstream economists who have thought seriously about liquidity, usefully distinguishes "funding liquidity" and "market liquidity."[45] While the latter is the familiar property of an asset, describing how easily and reliably it can be converted into money, the latter describes how easily you can emit new liabilities to meet your payment needs. (A credit card is a source of liquidity in this second sense, even though you cannot sell it.) Even if we limit our discussion to the asset side, the fear of capital loss is not the only way in which uncertainty makes some assets more attractive than others. As we'll see in the next section, in other historical contexts it can even favor longer assets rather than shorter ones.

Liquidity Preference and Solidity Preference

The desire for a balance sheet position that preserves the ability to make unexpected payments is not the same as the desire for one that reduces the chance of capital losses. In some cases, they may be substantially overlapping, as in the choice between money and generic "bonds" that Keynes uses in his presentation. But in other cases they point in opposite directions.

One reason for this is that a capital gain or loss is something that happens to a particular asset, while liquidity in the broader sense is a property of a balance sheet as a whole. An asset that is not easily salable and vulnerable to capital losses may nonetheless improve the liquidity position if it offsets an existing liability. A house, for instance, is a very illiquid asset, and subject to large price swings. For an investor, a desire for liquidity is a reason *not* to own houses. But for a family that will need to live somewhere in any case, the calculation may go the other way—owning a house can offer protection against uncertainty and leave them less likely to find themselves unable to make important payments.[46]

The same reasoning applies for businesses. Uncertainty about the future may lead management to prefer to hold cash, rather than make an irreversible investment. But it also may lead a business to invest in its own

capacity to produce essential inputs if market access to them looks uncertain. Firms that vertically integrate are, in most cases, probably less interested in directly raising their income, as in making themselves less vulnerable to the choices and circumstances of their suppliers. This is why, for instance, a number of manufacturers announced plans to develop their own chip production facilities following the pandemic era supply chain disruptions of 2020–2021. Here uncertainty was a spur, rather than a barrier, to investment.

One way of thinking about this tension is *income uncertainty* versus *capital uncertainty*. Owning a bond gives you two distinct legal rights: to receive the stipulated interest payments, and to transfer the bond to someone else—sell it, pledge it as collateral, and so on. (Real bonds will also include a number of other commitments by the issuer—to provide financial reports and other information, not to issue more-senior bonds, to abide by various financial covenants, etc.) Suppose the interest rate on a given type of bond rises. As an owner of the bond, this is bad news for you—its market value will decline. But as a recipient of income from that type of bond, it will be good news—as you reinvest the income and eventually the principal, the new bonds you buy will give you a higher income. Capital uncertainty—which Keynes focused on—is the question, What will happen to the value of this bond while I own it? Income uncertainty is the question, When this bond matures, what will I be able to reinvest the principal in?

Which of these questions matters more for you depends on how far forward you are looking. If you are going to sell the bond next year (or if you must regularly mark your holdings to market) the short-term capital gain or loss matters much more than the eventual lower or higher income. So you will pay more for (that is, accept a lower interest rate on) a short-dated bond, which exposes you to less capital risk. If you are someone who expects to receive bond income indefinitely—canonically "widows and orphans," more plausibly endowments and pension funds—you should worry more about income risk. So you would pay more for (accept a lower interest rate on) a long bond, which offers a more stable income.

There's an analogy with the homeowner example. If you are likely to move next year, buying a house exposes you to additional risk, since its price may rise or fall in the meantime (not to mention the transaction costs of buying and selling it). But if you expect to live in the same place for

many years, buying reduces your risk—you no longer have to worry about the rent going up.

In financial market settings this tension is described in terms of *duration* and *horizon*. Duration refers to how far in the future the payments are or, equivalently in this context, how much the value of the asset changes in response to a change in prevailing interest rates. For example, if the prevailing interest rate is 5 percent, then a promise to pay $100 a year from now is worth just a bit over $95 today, while a promise to pay $100 ten years from now is worth about 61¢. Now suppose the prevailing interest rate increases to 6 percent. The market value of the first promise will fall to $94, barely 1 percent. But the market value of the second promise will fall to 56¢, or nearly 10 percent. The second promise has a longer duration because payment comes farther in the future, which means its value is more sensitive to changes in interest rates.

For a simple zero-coupon bond like those in the example, the duration is just equal to the maturity or tenor—the time to payment. For other instruments, duration is defined as the tenor of a zero-coupon bond whose price is equally sensitive to changes in the interest rate. Horizon is, in effect, the period over which the holder of the asset is evaluating the returns. If the holder's horizon is longer than the average duration of the assets they invest in, a rise in yield should make them happy, since the increased future income will outweigh the capital loss. If their horizon is shorter than the average duration, a rise in yield will make them sad since (from their point of view) the capital loss today is not compensated for by the higher yields they will eventually get as they reinvest their income. If horizon and duration are equal, they won't care either way.

Whether capital uncertainty or income uncertainty dominates, then, will depend on the horizons of asset owners compared with the duration of their assets. Keynes's focus on capital uncertainty makes sense in a world where durations are long and horizons are short. Keynes vividly evokes the short horizons of modern financial markets, though their importance for the argument gets lost as it is formalized in subsequent chapters. But is it always a good assumption for the real world?

Much of today's financial wealth is owned by institutions like pension funds and endowments. These owners *ought* to have very long horizons,

since they are effectively immortal and the expenditures that their assets are intended to finance lie far in the future.

In practice, they do not. A pension fund or university does not, as such, buy assets. They hire professional managers and regularly assess their performance. The pension benefits may not be payable for thirty years. But the fund manager's contract might be up for renewal in two years, and the person sitting at the terminal may have their performance reviewed every quarter.

The horizon that matters is that of whoever is actually making the decisions, not the ultimate owner. In a world where markets somehow operated to perfectly align everyone's interests the distinction wouldn't matter, but in the real world of pervasive incomplete information and principal-agent problems, it matters a great deal. These conflicts are not just between the asset owner and the fund manager—or often multiple levels of intermediaries—but among the employees of each of the institutions and, in the case of something like a pension, between the institution and the ultimate beneficiaries. The relevant time frame for these institutions is probably no higher than for any other financial market participant. In a world of professional fund managers, "patient capital" is a myth.[47]

For modern financial markets, then, it is reasonable to assume that capital uncertainty dominates; all else being equal, asset owners will prefer shorter maturities to longer ones. Production, however, takes place through ongoing organizations—corporations, but also households and governments—that must invest in long-lived capital goods and relationships with employees, customers, and suppliers. For these ongoing commitments, they need long-term financing. So a vast quantity of long-dated liabilities are issued by both the private and public sectors. This chronic mismatch is why we think of the normal yield curve as sloping upward—longer-term interest rates are higher than lower ones. It also helps explain the "equity premium puzzle"—the fact that returns on stocks are normally higher than on bonds, even after adjusting for risk.

These conditions have not always existed, however. In the nineteenth-century United States, longer maturities typically carried *lower* yields than shorter ones. Bonds with longer maturities typically could be sold more easily than shorter ones, while the shortest-term debt (commercial paper and similar instruments) carried the highest interest rates. In 1864, for

example, when the Union government had nearly won the war but still had a long way to go in financing it, it "made an attempt to sell 5s [bonds with a face value yield of 5 percent], which met with a lukewarm reception. In order to attract investors to the lower rate the Treasury extended the term to redemption from five to ten years and the maturity from twenty to forty years."[48]

The same pattern exists in corporate bonds. As late as 1910, a high-grade corporate bond with one year left to run traded at a yield of 4.25 percent, while a similar ten-year bond yielded 4 percent and a thirty-year bond 3.8 percent. Prime commercial paper, meanwhile, was yielding over 5 percent.[49] This pattern also existed in the UK, where consols—the perpetual bonds mentioned earlier—typically carried the lowest interest rates of any outstanding government debt.

This pattern looks like an anomaly from today's perspective. Yield curves normally slope upward, with longer bonds carrying higher interest rates, and "inversions" are seen as rare events (often presaging economic downturns). It is taken for granted that longer rates must be higher to compensate asset owners for the greater capital uncertainty, or risk of capital loss, associated with longer-term bonds. But the analysis here points to good reasons why we might expect a positive yield curve in modern economies, and a negative one in the conditions of the nineteenth century.

Axel Leijonhufvud, as usual, gets to the heart of the relevant issues. His discussion is worth quoting at length:

> Currently active households must, directly or indirectly, hold their net worth in the form of titles to streams which run beyond their consumption horizon. The duration of the relevant consumption plan is sadly constrained by the fact that "in the long run, we are all dead." But the great bulk of the "fixed capital of the modern world" is of a very long-term nature . . . and is thus destined to survive the generation which now owns it. . . .
>
> . . . The same conception underlies Keynes's liquidity preference theory of the term structure of interest. Mortal beings cannot hold land, buildings, corporate equities, British consols, or other permanent income sources "to maturity." Induced by the productivity of roundabout processes to invest his savings in such income sources, the

> representative, risk-averting transactor must suffer "capital uncertainty." Forward markets, therefore, will generally show a "constitutional weakness" on the demand side.[50]

One might quibble with the passage's emphasis on the mortality of human beings. In a world of professionally managed money, the relevant lifespan is not that of the ultimate owner of the wealth but that of the relationships among those who, in practice, control it. The turnover of institutions (and individuals within those institutions) in the management of funds is more relevant than the life expectancy of the individuals or families on whose behalf it is managed.

We should also amend Leijonhufvud's formulation to note that the problem with wealth in the form of long-lived production processes is not just that it produces income far into the future, but that wealth in this form is always in danger of losing its character as money. Once capital is embodied in a particular production process and the organization that carries it out, it tends to evolve into the means of carrying out that organization's intrinsic purposes, instead of the capital's own self-expansion.

Neither of these caveats detract from the main point, which is the mismatch between the horizon of wealth owners and the duration of the instruments in which wealth is constituted.

The attractions of long-lived production processes and the need to finance them are inescapable in modern industrial economies, which explains the constant search for liquidity. But they are not universal features of capitalism. Long-lived means of production were much less important in the nineteenth century, and to the extent they did exist, they were seldom an outlet for investment by outside wealth owners. Money capital's role in production was to finance stocks of raw materials, goods in process and inventories, which turn over quickly.

In the US, bonds were sometimes issued by private canal companies in the 1820s and by railroads starting in the 1830s. But the volume of private bonds outstanding was small until fairly late in the century. Equity came even later; while issuing stock was a standard way to finance railroads, few other businesses were organized as publicly traded corporations before the 1890s. In 1885, there were 151 companies listed on the New York Stock

Exchange, of which over 80 percent were railroads. Not until the 1920s did the publicly traded corporation become the dominant organizational form for large American businesses. At the same time, the modern financial-management industry did not exist; assets were more likely to be held directly by the beneficial owners.[51]

For the mid-nineteenth-century owner of financial wealth, then, the big worry was not that they would be stuck holding assets whose value might fall. It was that there might be nowhere to reinvest their income, and the principal when their assets matured. The safe thing to do, in this situation, is *not* to keep your options open. It is to lock in a good thing when you can.

For nineteenth-century American asset owners, you could say, income uncertainty was a bigger concern than capital uncertainty. And so financial markets were characterized by solidity preference rather than liquidity preference.

The preference for money and similarly liquid, short-dated assets is not a universal response to uncertainty. It is, rather, the result of the development of production around long-lived means of production and ongoing relationships, on the one hand, and the organization of wealth ownership in the form of easily transferable, interchangeable claims, on the other. This tension between the logic of production and the logic of money is a central feature, not of all times, but of our time.

The Management of Interest Rates

If we think of the interest rate in terms of the relative price of more and less illiquid assets, which in turn depends on the overall liquidity of the financial system, that has implications for how we think about their management by central banks.

To begin with, this perspective clarifies how a central bank is able to influence interest rates at all. As discussed in the first section, if the interest rate fundamentally reflected the price of goods today relative to goods tomorrow, it’s unclear how a central bank—which neither buys nor sells goods, neither today nor tomorrow—could have any influence over it. Central banks are, however, very much in the assets and liquidity business. They have many ways to make balance sheet expansion safer and cheaper, or riskier and more costly.

As many economists—including former Fed chair Ben Bernanke in his earlier academic career—have observed, it's very hard to find evidence that changes in interest rates themselves have any direct influence on investment spending, especially by businesses. Instead, to the extent that monetary policy influences new borrowing, it seems to be mainly through the credit channel—changes in the willingness of banks to make loans at all. It also may influence economic activity through changes in the prices of other assets. The wealth effect from high stock prices probably played an important role in sustaining demand in the late 1990s. It's widely recognized that changes in the exchange rate may be a more important transmission mechanism for monetary policy than the traditional channel via credit-financed investment spending, especially for smaller countries.

Central bankers have told a variety of stories to explain the effectiveness of monetary policy. Bernanke's starting point was precisely the inadequacy of a simple story about "the" interest rate to explain how monetary policy actually works. Going back a bit further, the Fed's leading economist of the 1950s, Robert Roosa, was very clear that neither the direct effect of Fed policy shifts on longer rates, nor of interest rates on real activity, could be relied on.[52] What mattered, rather, was the Fed's ability to change the willingness of banks to make loans. This was the "availability doctrine," a predecessor of Bernanke's credit channel, which guided monetary policy in the postwar years. If you think monetary policy is generally an effective tool to moderate business cycles, you have to believe something like this.

For now, we can remain agnostic about the effectiveness of monetary policy at smoothing out short-term fluctuations in demand. To give a coherent account of how monetary policy can work even in principle, you need to think of the interest rate as the price of liquidity that is set in the market for existing assets, not the price that balances the flow of new investment spending with saving. Central banks neither save nor engage in investment. Nor do they have any authority over the businesses and households that do.

Once we see the interest rate as the price of less liquid relative to more liquid assets, it is straightforward to see how central banks can influence it. They do so not through any special legal authority, but in the same way any other large market maker or dealer might do so, by changing the terms on which they are prepared to buy and sell various assets.

A further implication of the liquidity and asset-market view of interest rates is that there is no basis for the conventional dichotomy between monetary policy and financial regulation. The goal of monetary policy, as conventionally understood, is to manage the level of aggregate spending in the economy by making it easier or harder for households and businesses to borrow, which in turn requires making it harder or easier for the banking system to expand its balance sheets. This is what changes in the policy rate (the federal funds rate or equivalent) are supposed to do. But many other actions by central banks and other public bodies also do this, whether or not that is their explicit intent. Any regulatory change that tightens or loosens limits on bank balance sheets also operates as a tightening or loosening in the monetary policy sense. Any central bank action—actual or anticipated—that makes some class of assets more or less liquid will similarly change the scale of lending banks are willing to carry out. This is obvious when it is a question of central banks buying mortgage-backed securities in order to support mortgage lending. But the same principle applies more generally.

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Since the 1990s, there has been considerable convergence among central bank practices. A single instrument, the overnight interbank lending rate, is aimed at a single target, an inflation rate of 2 percent (perhaps a bit higher in lower-income countries). Institutionally, central banks are legally "independent," and often staffed by US-trained economists. The combination of a single interest rate instrument, a single inflation target, and formal independence is sometimes referred to as the "holy trinity" of central banking.[53]

Historically, there has been much greater variation in the tools employed by central bankers. A 1971 report for the House Banking Committee observed that central banks elsewhere used "a wide range of instruments" to control the flow of credit, including "rediscounting privileges, direct loans and investments, . . . reserve requirements and credit ceilings, . . . direct credit controls, approval over individual loans, exemptions from normal restrictive regulation and control over non-bank financial intermediaries."[54] Open-market operations were rare outside the United States, and while official interest rates were often used for discount window lending, this was usually a relatively minor part of the monetary policy toolkit.

Even in the US, the overnight interest rate was not the main tool of monetary policy before the 1980s. Sectoral credit policy in the service of economic development largely disappeared from the US economic policy conversation not long after the end of the Second World War. But there was widespread agreement that regulating the overall pace of credit expansion required a range of tools, not just a single interest rate. Through much of this period, the function of reserve requirements was better understood as controlling the quantity of lending rather than the interest rate.

Once the Fed began announcing a target for the federal funds rate in the mid-1980s, it had to supply whatever level of reserves were required to bring the rate to that level. But in earlier decades, it could set the quantity of reserves and let the interest rate settle where it would. In a context where there were no close substitutes for commercial bank deposits, this allowed for fairly tight control over the total volume of lending.

Today, the single policy rate and the rigid inflation target are the two pillars of central bank orthodoxy. But in the past they could be in tension, since it seemed obvious that inflation control would be more effective if it used a broader range of instruments. In 1969, for example, Congress passed the Credit Control Act, giving the Federal Reserve wide-ranging authority to impose limits on lending in order to control inflation. At that time, a strict focus on price stability and the use of a single policy instrument seemed like conflicting goals, not complementary ones. The identification of price stability with following the “natural” interest rate is an ex post justification of current practices, not a reflection of anything fundamental to central banking.

The mid-twentieth century was the high point of active credit policy. But for much of their history, central banks have not engaged in any kind of active direction of the financial system or economy, functioning rather as central clearinghouses for interbank payments and fiscal agents for national governments. Even as they grudgingly accepted their responsibility for controlling financial and balance-of-payments crises from the mid-nineteenth century on, this did not entail any responsibility for the broader macroeconomy. As Paul Volcker—a shrewd observer of the institution he led, whatever the purposes he turned it to—observed, “historically, in fact, the ‘monetary’ functions were largely grafted on to the ‘supervisory’ functions, not the reverse.”[55]

In short, setting an interest rate is simply one case of a much more general activity. One might describe this more general function as regulating the pace of credit expansion or the growth of the balance sheets of banks and other financial institutions; as influencing the relative price of more and less liquid assets; or, in the language used above, as setting the terms on which promises can be exchanged for other promises or for claims on real resources.

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As with many questions, what might seem like an abstract theoretical debate became more immediately relevant in the wake of the global financial crisis. Central banks around the world, facing the exhaustion of conventional monetary policy, engaged in "quantitative easing" (QE) by buying large quantities of longer-maturity government and in some cases corporate bonds. In the US, these purchases, despite their enormous scale, had little discernible effect on interest rates. In Japan, by contrast, yields on ten-year bonds quickly fell to zero after the Bank of Japan began its own QE program. The difference was that in Japan, but not the US, the central bank announced an explicit goal for longer-term interest rates—a policy known as "yield curve control."[56]

The lack of an explicit interest rate target is what makes QE "quantitative"—the Fed is purchasing a definite quantity of bonds, rather than announcing a price and purchasing whatever it takes to reach it. This policy is often explained in terms of a demand curve for bonds. Markets will hold so many trillions at a yield of 5 percent, some smaller amount at a yield of 4 percent, a still smaller amount at a yield of 3 percent, and so on. As central bank purchases reduced supply, market equilibrium would move up the demand curve, raising the price and lowering longer-term interest rates. In this story, announcing an explicit goal might be convenient but wouldn't change whatever fundamental factors influence market participants' desired holdings of bonds.

In a world where asset prices are conventional, on the other hand, we cannot speak of a "demand curve" for bonds, since the demand for bonds is not independent of the current price. If market participants expect the yield to be 3 percent, that implies large capital losses for anyone buying a bond at a price that implies a lower yield. So the interest rate won't fall below that

level, no matter how much the supply of bonds falls. Rather than a normal market with an upward sloping demand curve, we can at best imagine a vertical demand curve, at whatever price market participants believe is normal for that kind of bond. What's needed, then, is not to change the quantity of bonds available to the markets, but to change market participants' beliefs about the future value of those bonds. That's the difference between yield curve control and quantitative easing.

It's easy to understand why the Fed preferred the QE approach—it preserves the fiction that interest rates are being set by "the market." The Fed did not want to be perceived as planning or administering a critical market price—and perhaps, being responsible for the outcome. This latter consideration was explicitly acknowledged in discussions within the Fed during the monetarist experiment of the early 1980s, when the Fed allowed short-term interest rates to reach historic highs while insisting it had no explicit target for them, only for the money stock. (These discussions are released publicly only many years after the fact.) In 1982, for example, Frank Morris of the Boston Fed argued against returning to an explicit interest rate target on the grounds that targeting a measure of the money stock instead "has sheltered the central bank from a direct sense of responsibility for interest rates."[57]

Admitting that long rates are conventional and that the Fed has the power to shift conventions means that it is not just conforming to preexisting "real" values or fundamentals but actively choosing from many possible values. This undermines the case for the apolitical, independent central bank. There is discomfort even about admitting that the Fed sets the overnight rate that is its primary policy tool. If you look up the federal funds on the Fed's website and read the documentation, you will find that this rate is "essentially determined by the market" and merely "influenced by the Federal Reserve."[58] There is a profound resistance, inscribed right in the data, to the idea that interest rates are chosen consciously rather than determined naturally in the market.

An even more dramatic example of this dynamic came during the European debt crisis discussed in chapter 2 of this book, when interest rates on government bonds spiked dramatically in 2010–2011—not just in crisis-hit Greece, but in countries like Spain, Italy, Ireland, and Portugal. In the latter two cases, the interest rate rose from 4 percent to over 10 percent in

less than a year, even while the European Central Bank (ECB) was cutting its own rate to zero. The rise in interest rates reversed abruptly after the ECB communicated its willingness to intervene in the market for sovereign bonds (previously verboten in the euro area). Interest rates then fell as quickly as they earlier rose; not long after Draghi's "whatever it takes" speech, Portugal, Ireland, and the rest were borrowing not only at precrisis interest rates, but at the lowest rates in their history.

It's hard to square these wild swings with a story of interest rates as an intertemporal rate plus risk premium. Whatever characteristics of these countries might create the possibility of a default, they were not radically different in 2011 than in 2010, or 2012.

To be fair, it is possible to reconcile the apparent autonomy of interest rates with a story in which they reflect an intertemporal rate plus a rational assessment of default risk. There just need to be two distinct equilibria. The story goes like this. When the government faces a 4 percent interest rate on its bonds, it has no trouble making debt service payments along with other expenditures out of its existing revenues. So default risk is low, and the low interest rate is appropriate. But if interest rates were much higher—say 10 percent—the burden of the debt would be greater, and market participants in this story might reasonably doubt whether the government would be able to make the necessary budget adjustments to make payments. So default would now be much more likely—making the high interest rate necessary to compensate for the risk.

This "doom loop" is one of the relatively rare cases where mainstream analysis allows some autonomy to financial variables. It has echoes of Keynes's observation that the best cure for "excessive" borrowing is often low interest rates, not high ones. Certainly, there are cases where the question of whether some economic unit is a good credit risk, in the sense of having a low probability of default, depends on the terms on which they can get credit. (This is the whole principle behind a bank run.) But this is still thinking of debt in terms of a stream of future payments. Once we think of it as an asset in its own right, it's clear that the doom loop is not necessary to explain the crisis in 2010–2011. Bondholders didn't have to expect a default to want to get rid of their holdings; it was frightening enough that the bonds themselves were rapidly losing value.

Nor does this story explain why the ECB's intervention had such an immediate effect on bond prices. The ECB, after all, was not proposing to directly solve any fiscal gap by lending to governments itself. The prohibition against this is deeply written into its DNA. So it is *not* the case that the ECB's intervention had any direct effect on the various governments' fiscal position or default risk.

Rather, it was purchasing existing bonds—and making clear its intention to continue doing so. That this was so dramatically effective suggests that the underlying problem was the self-confirming expectations in the market for bonds, and not the budget positions of the governments that issued them. When we think of bonds as assets in their own right—and not just placeholders for a future stream of income with its associated risk—both the crisis and resolution make sense.

Just as the real-exchange view of the economy says we can abstract away from money and think about commodities in relation to each other, the equivalent view of financial assets thinks that we can abstract away from the assets themselves and simply talk about the corresponding money flows. The value of a bond, in this view, is just the present value of the dividends it will pay—which in the case of a government bond, depends on the excess of revenue over noninterest expenditure available for the bondholders. This implies strong arbitrage conditions—the same flow of money should have the same value.

We are suggesting a different view. Just as money has a distinct existence apart from the real things it gives a claim to, financial assets have a distinct existence apart from the flows of money they give rise to. Which means that rather than arbitrage between different assets, it may be self-confirming expectations—and the ability of institutions like central banks to shift them—that determine asset prices in practice.

Comparing expected cashflows can, obviously, be a good way to decide what price an asset "should" have. But thinking of an asset as a set of discounted cashflows is useful mainly when comparing similar assets in a given setting. It is unhelpful when it comes to explaining changing conditions in financial markets, or the forces influencing the relative prices of different kinds of assets. Lawrence Summers has mocked this kind of analysis as "ketchup economics," which painstakingly shows "that two quart bottles of ketchup invariably sell for twice as much as one," without

shedding light on the underlying reasons for changing ketchup prices.[59] As we've seen, in many important cases the asset has a life independent of the money flows it promises, and behaves in ways that can't be understood if we reduce it to the latter.

Interest Rates or "the" Interest Rate?

Keynes's presentation, we noted earlier, works with two assets: money and bonds. In the real world, there are many assets, some of which are more or less money-like. Liquidity and conventional prices are not properties of one asset or one particular interest rate but play their roles throughout the whole structure. Thus, one implication of the monetary view of interest rates we are developing here is that we should reject the conventional distinction between "the" interest rate, on the one hand, and the spreads between various market rates on the other hand. In a fuller liquidity-preference story, there is no distinction between "the" interest rate and the spreads.[60]

Once we think of interest rates in terms of asset prices, whose "fundamentals" always include liquidity and other characteristics beyond the cash flows they (are expected to) give rise to, and whose prices are often strongly conventional, there is no longer a reason to expect all these prices to move together. In the real world, in other words, there is not one interest rate, but a great many of them. This means that, in reality, the business of central banks is not the textbook manipulation of a single policy rate, but the management of financial conditions more generally. As the Indian central bank governor Y. V. Reddy put it, "While monetary policy influences aggregates, reality is often disaggregated. Hence, the RBI uses prudential regulatory policies to complement the monetary policy measures and objectives. It is pertinent that the lender of last resort function is not separate either from monetary and liquidity management or from financial regulation. Thus both monetary policy and prudential regulations are used as complementary tools to achieve the central bank objectives, and they both support and reinforce each other."[61]

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For an example of how many interest rates can coexist at the same time, consider mid-2021. At that time, the US government's shortest-term debt

carried an interest rate of 0.05 percent, while ten-year Treasury bonds paid 1.3 percent. The typical thirty-year mortgage carried 3 percent interest, while Baa-rated corporations could issue bonds paying 3.6 percent. Credit card rates, meanwhile, averaged around 15 percent.

In the orthodox view, all of these rates can be divided into two parts. There is the pure interest rate—the terms of trade between consumption today and consumption a year from now—which is incorporated into all of them. And then there is the credit spread—the additional amount creditors demand to compensate them for the possibility that the promised payment will not be made. In a well-functioning credit market, the spreads between different interest rates will make the expected payment from any credit interest equal (allowing for normal risk aversion). Factors relevant for the interest rate as such will move all these rates up or down together, while changes in the spreads between them will depend on whatever idiosyncratic characteristics of borrowers make them more or less likely to repay in full. An investor or banker needs to be very concerned with these, but if we are interested in the economy as a whole, then—in the orthodox view—we can safely ignore the latter and focus on the former.

Credit risk is real. But it alone can't explain the range of interest rates we see around us. Consider the range of interest rates on government debt of different maturities noted earlier. The possibility that the federal government would, in the next year, repudiate all its debts and stiff its bondholders is, it's safe to say, was quite a bit less than 1.3 percent. Whatever the spread between the three-month Treasury bill and ten-year bonds was compensating their owners for, it was not that.

There are two further reasons, less obvious but equally decisive, for rejecting the idea that these various rates can be understood as "the" interest rate plus a credit risk premium. First, the whole structure of rates does *not* move together; some interest rates are closely correlated with the overnight rate set by the central bank, while others show little or no correlation with it.[62] And second, the various rates sometimes move for reasons that have no plausible connection with the default risk of the borrower but clearly reflect broader financial conditions.

From the monetary perspective, by contrast, there is no sharp line between spreads and "the" interest rate. The difference in yields between a pair of bonds reflects the same fundamental forces that determine absolute

yields. Just as a shorter bond pays an interest rate because it is less liquid than money, the longer bond pays a higher interest rate because it is less liquid than the shorter one. In the case of Treasuries specifically (though not for other assets) Keynes's further reduction of liquidity to capital uncertainty is reasonable. The longer bond pays a higher rate because of the greater risk that interest rates will change over the life of the bond, and the greater scale of potential capital gains or losses if it does. But again, these are the same kind of specifically monetary risks that interest is paid in compensation for; they have nothing to do with the terms on which real goods a decade from now trade for real goods today, or with whether the federal government will in fact make the promised payments.

For longer versus shorter Treasuries, this is the main story. The most important consideration when buying a ten-year bond is, What is going to happen to the price of ten-year bonds in the next few years?

But additional financial factors can come in from the creditor side. In periods of financial stress, there is systematically less willingness to hold less-liquid assets. Sustained periods of stability have the opposite effect. This is not about risk premium per se. The concern is not whether the debtor will repay. It's about the possibility of financial distress for the *creditor*, in which case more liquid assets will be better to have on hand than less liquid ones. We can see this in the corporate bond market—spikes in yields follow defaults; they do not anticipate them.

One dramatic example of this phenomenon was the very large spike in corporate bond rates during the financial crisis of 2008–2009. For Baa-rated bonds, rates rose from 6.5 percent at the start of 2008 to 9.2 percent by November and remained elevated through 2009. This spike in bond rates did coincide with a very large increase in corporate defaults. But—and we want to stress this—the rise in corporate bond rates during the crisis cannot be seen as a rational reassessment of risk. The bonds that defaulted or were downgraded in this period had been issued years earlier, when corporate bond rates were quite low. The (relatively few) corporate bonds issued in 2009 went on to have a historically average rate of downgrades and defaults in subsequent years.[63] They were, in other words, no more risky than similarly rated bonds issued in other periods. So the sudden spike in corporate bond rates did not reflect any increase in the riskiness of the borrowers. Nor did it reflect a general rise in "the" interest rate—over the

same period, the federal funds rate fell from 4 percent to zero. Rather, it reflected a sudden decline in the capacity of the financial system to hold this type of relatively illiquid asset.

Conclusion

Orthodox thinking on the interest rate says that it fundamentally reflects the trade-off between the present and the future. It is the price of saving, the reward for "abstinence" as Nassau Senior described it. Terminology has evolved since then, but the fundamental concept has not.

Keynes and his followers categorically reject this concept of interest. The markets where interest is set—both in new loans and transfers of existing ones—do not involve any trading off of present versus future consumption. And interest rates do not, in practice, behave anything like the intertemporal exchange rate of theory. In its place, the monetary-production view offers two distinct but complementary ways of thinking about interest: as the price of liquidity, and as the price of particular assets relative to others. Either way, what interest is paying for is the rearrangement of claims to money payments. This rearrangement is valuable precisely because future outcomes themselves can neither be known nor contracted over.

Asset prices can offer an alternative way of explaining interest rates insofar as those prices are autonomous—insofar as the assets themselves have properties, and therefore a market price, independent of the future streams of income they give rise to. This is a fundamental premise of the view on money we are developing here. Just as money prices and payments cannot be reduced to some underlying "real" quantities, financial assets cannot be reduced to an underlying stream of future payments. This means that their prices involve a degree of convention—they are what they are because that's what they are. Convention may not be important for assets that are purchased to be used directly or held to maturity, but insofar as the possibility of capital gain or loss is a factor, prices will be to some degree conventional.

Both the liquidity premium and conventional asset pricing are reflections of the fundamental uncertainty or unknowability of the future. But they are not the same thing. Their relative importance depends on the context and the question we are interested in.

These factors operate throughout the whole pattern of asset prices—there is no basis for the commonplace distinction between “the” interest rate and the spreads between that and other rates. It is only thanks to liquidity and convention that central banks are able to influence interest rates and achieve whatever larger goals they may have.

Thinking of interest in terms of asset prices requires a sort of figure-ground reversal. We are used to saying that because the interest rate is 3 percent, a promise of $103 a year from now is worth roughly $100 today. Instead, we should see the price of the promise as the fundamental thing—incorporating whatever other qualities the promise in its concrete form may have—and the interest rate as at best a convenient shorthand for describing that price.

One important implication of this view is that the holder of the promise, or asset, must think about the market for the asset itself, and not just the flow of future payments it gives claim to. The longer the asset’s duration relative to the holder’s horizon, the more salient changes in the price of the asset itself will be. This is what creates space for convention to operate as an independent factor in the prices of bonds and other credit assets, and the corresponding interest rates.

The distinction between future incomes and the particular assets that promise them is critical to understanding interest rates in the real world. It also points to a more far-reaching contradiction. You can protect yourself from an uncertain future by expanding the scope of commands you are able to give to others. Or you can do so by limiting the scope of commands others are able to give to you.

The owner of wealth wants to hold it in as general a form as possible—as a claim against society at large, exercisable on whatever terms the owner prefers. We can think of money as conveying the right to give a command—give me that object; perform that labor. The holder of that right would like to be able to give whatever command they choose, to whomever they choose, whenever they choose. But the ongoing existence of any kind of social organism requires some limits on the commands that can be given to its constituents.

Marx famously speaks of money as the universal equivalent. And so it is—as long as that is understood to express an aspiration or hypothetical endpoint. In reality, claims on money, and through money on human labor

and its products, can only be exercised through particular assets, which always have their own particular qualities in addition to moneyness. Money in the bank is always money in some individual bank, a fact that can be safely ignored until it can't. The desire for more money is constantly in tension with the desire for something that is more purely money.

Let's return one more time to the mortgage contract with which we began. As we noted then, both parties are making promises of future payment to the other. As we've stressed, there is nothing being "loaned," being given temporary use of, in the way that a physical object might be. Rather, there is a swap of IOUs. The difference between the "lender" and the "borrower" is that the latter can call on their IOU immediately, while the former can demand payment only on a fixed schedule. This flexibility (on the asset side) and certainty (on the liability side) is what the borrower is paying a premium for. They are gaining the right to give commands—to take ownership of the house, with the implied right to call on the coercive violence at society's disposal to maintain their exclusive use of it—while getting some protection against monetary claims made against them.[64]

The tension between wealth owners' desire for a flexible, open-ended, universal claim on society, and society's own need for particular, lasting commitments exists throughout financial markets. It operates not only within the financial system, but at the interface of finance with the nonmonetary world. From the perspective of wealth owners—whether holders of bonds, shares, or some other financial claim—a business is simply a vehicle for turning money into more money. In its own existence, however, a business is engaged in some particular activity, some particular transformation of the material and social world, and has its own distinct social character—its own structures of authority, norms, and ongoing relationships between the human beings who make it up.

The unresolvable tension between the logic of laying out money to acquire more money, on the one hand, and the concrete human organizations and activities through which the money must pass, is one of the central contradictions of the societies in which we live.

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Part 4

Money and Things

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6

The Fetish of the Real

> The one obvious instrument of measurement available in social life is money. Hence, the range of our inquiry becomes restricted to that part of social welfare that can be brought directly or indirectly into relation with the measuring-rod of money.
>
> —Arthur Pigou, *The Economics of Welfare*

The Real and the "Real"

The measurements with which we describe the economy are almost entirely quantities of money. What we call nominal or money quantities are directly observable. Your mortgage or car loan requires a schedule of payments in a currency, say, dollars, in some fixed proportion to the value (also in dollars) of the original loan. Those are the numbers you can see in your contract. The S&P 500 index is at 4300; a year ago it was at 3806. Those are numbers you can look up on any financial website; anyone anywhere in the world will see the same ones. You paid $2.50 for a tube of toothpaste; the bills and coins changed hands. The dollar is trading at Rs 80; this is a fact, which shapes any activity that crosses the border of the US and India. Money world, in this sense, is real.

But what do these money values mean? They function as measurements, but what do they measure? Within a given exchange community, they have an objective meaning. For an individual within the community, the fact that two objects—or more precisely, two distinct property rights—have an equal price, implies the possibility of a choice between them. Under some kind of budget constraint, ownership of *this* stuff and ownership of *that* stuff are equivalent, in the sense that one can have one more of one by giving up an equal value of the other.

But what about when comparisons are made outside of an exchange community? If there is no possibility of substitution either in the purchase or production of things—where there is no market in which they exchange—is there a sense in which we can nonetheless compare their value? Do the quantities of money describe some underlying "real" quantity?

This is an old question in economics. For the classical economists, the question of what real quantity underlay market prices was a central concern. There should be some sense in which a given amount of value was equivalent to a given amount of some physical substance. David Ricardo insisted that there could be no "measure of either length, of weight, of time or of value unless there be some object in nature to which the standard itself can be referred."[1] He spent much of his life struggling with the question of what object in nature observed prices referred to, without coming to a satisfactory answer.

Both the everyday language we use and economic theory are strongly, albeit mostly implicitly, committed to the idea that there is one. We assume, without thinking about it too much, that monetary aggregates like GDP are measuring some underlying quantity. We have no problem comparing the "real" income of different countries, even though much of what is purchased in one cannot be exchanged with what is purchased in another. The question of what a dollar was worth in 1950 or 1900 seems to have a straightforward answer. There are any number of online calculators that will spit out supposed facts like, "If you were to buy exactly the same products in 2022 and 1850, they would cost you $100 and $2.97, respectively"; most of us don't worry too much about *which* products exactly, or what it means for them to be exactly the same. Even the GDP of various ancient Roman provinces seems like a figure that should in principle have a value, even if it's hard to assess in practice.

The argument of this chapter is that questions like this do not, in fact, have answers. Despite the deep-seated assumption that money values capture some underlying reality, we cannot unambiguously treat them as proxies for some underlying "real" quantity.

This is not news to careful students of the national accounts. As Utz-Peter Reich, one of the great scholars of national accounting, puts it, "nominal values are real values in the sense of 'actual,' and of what is observable as a statistical fact, while real values, as conceived by economic value theory, are constructs."[2] Nominal is real, ontologically speaking.

Economic theory traditionally takes the opposite view from the national accountants. It treats money as a veil that obscures the true reality that we are trying to deal with: disparate commodities in exchange. In such a view, money is "neutral." "Real" variables like output and employment are seen

to be independent of monetary variables, and the primary function of money is to act as a lubricant to the production process. Conversely it is often imagined that what is real in the world—biophysical reality, relationships, and the like can be expressed in terms of money. The ever-expanding role of money in our lives serves to further cement this correspondence.

In Plato's cave, the shadows flickering on the wall are projections of material objects existing in external reality.[3] As any child who has made shadow puppets knows, however, the shadow of a rabbit or bird is not always cast by a real rabbit or bird. Jorge Luis Borges expressed this idea in the imaginary creature he called the peryton—a magical beast that had the body of a stag but cast the shadow of a human being.[4] In astrophysics, the term peryton has been adopted to describe nonexistent objects in distant space that are the apparent source of radio waves that in fact originate here on Earth. (The classic case was an open microwave in the building housing the radio telescope.) In the same way, we might think of an economic peryton as the apparent material object that is the source or referent of an observed money quantity.

The quantities that economists call "real" are not real in the sense of existing prior to their measurement by money. They are not a measurement of any independently existing quantity. Economic measurements like GDP are something like the score of a game—they are produced by a strict set of rules, which has a definite relationship with the concrete activity of the players on the field. But the score is not simply a measurement of something that already exists. There is no score until the game has been played. When we compare economic quantities in widely separated times and places, we are engaged in a hypothetical, like imagining the result of a matchup between two fantasy teams. In the economic case, further, there is an unavoidable subjective or normative component. Or as Keynes wrote in *The General Theory*: "To say that net output today is greater, but the price-level lower, than ten years ago or one year ago, is a proposition of a similar character to the statement that Queen Victoria was a better queen but not a happier woman than Queen Elizabeth—a proposition not without meaning and not without interest, but unsuitable as material for the differential calculus. Our precision will be a mock precision if we try to use such partly vague and non-quantitative concepts as the basis of a quantitative

analysis."[5] We may be able to compare the fraction of the population in paid employment in 1922 and in 2022 respectively, or the number of hours of work that an ordinary laborer would have to pay for the rent of their home. But the notion that there is a substance called "real gross domestic product" that existed in each of those years, and whose growth can be computed out to two decimal places, is a fantasy. Trying to convert our detailed records of money payments into a "real" quantity is like throwing out the baby but keeping the bathwater—a murky remnant that was once in contact with the thing we actually care about.

The methodological point that deflating a monetary aggregate by a price index does *not* turn it into a physical quantity is, again, well known to students of the national accounts (even if it is taught as the procedure to do so in standard economics textbooks). The ontological priority of nominal values is a central insight of the "money view" school of economics.

But there is an equally important point that is often missed: Imagining the entire world in terms of money is fundamentally a political project. It is both a symptom and a buttress of the dominance of capitalism in the organization of production and in our vision of the world. The idea that one can speak of "the price level" as an object existing in the world, waiting to be discovered, outside of our measurement process is one of the great sources of confusion in economics. And, we would argue, it, or more exactly its phantasmic double, "the real," is fundamental to the rule of money over our minds. As we work through the specifics of how "real GDP" and similar statistics are constructed, we must not lose sight of this central fact.

*

In this chapter, we will discuss the problems with treating monetary aggregates as if they were physical quantities through the concept of output, as measured by perhaps the single most important economic object of our times: gross domestic product.

GDP is the aggregate of a defined set of money payments, according to an evolving set of national accounts conventions. It is understood to correspond to material production—that's the "P." But what is observed and counted is the money.

Think of it this way. At the end of a trip to the supermarket, if we look at our basket, we can see both the commodities we purchased and the receipt that is their reflection in money terms. Both are present. But if we want to discuss the total amount that we bought without listing everything, we must use the total on the receipt. Summing up our grocery purchases requires us to first convert them to monetary quantities.

Objects in the real world are heterogeneous. They have their own quantitative measures—physical dimensions for tangible objects (weights, lengths, densities), hours for human labor, lumens for lighting, lines for computer code, flops for computer chips—but there is no natural or physical way of aggregating them, no scale that is appropriate across all units except a translation into money. Nominal gross domestic product in that sense is the sum of all the receipts in the baskets.

There are serious challenges to adding up the receipts—in effect, the statistical authorities don't have all the receipts and have to guess what the missing ones show. Other receipts may be inaccurate and mislabeled. And some things they would like to include don't generate receipts at all. These are important *practical* problems, but conceptually there is no problem with the idea of adding up all the numbers on some chosen set of receipts. The deeper problems come from the heterogeneity of the objects in the basket. This creates deep—indeed insuperable—challenges as soon as the sum of receipts gets interpreted as representing a quantity of stuff.

Over short periods, GDP in advanced capitalist economies mostly works acceptably as a rough and ready measure of aggregate economic activity. But this is so only because such a large fraction of activity under capitalism is based on paid employment and market exchange, and because the qualitative composition of that activity usually doesn't change much over the short run.

In the next part of this chapter, we look at GDP itself—the summing-up of various payments across the economy, beginning with its historical origins. Then, we turn to the conversion of this to "real" GDP, by dividing it by a price index. The purpose of this is to allow comparisons over time periods, which gets trickier as the separation in time gets larger, since the mix of goods being produced and consumed in the first period will be increasingly different from that in the last. We then ask what happens when

we calculate “real” values for specific sectors of the economy or categories of output.[6]

As the scare quotes in the previous paragraph suggest, we do not think that, in general, GDP can be used to make meaningful quantitative comparisons between qualitatively different economies over space and time. Not only are the underlying data often uncertain, error prone, or ambiguous, but the construction of the aggregates depends on fundamentally arbitrary assumptions and cannot be done in a logically consistent way. In our view, many uses of “real GDP” and similar statistics are a kind of anti-knowledge—a summing-up that erases, rather than aggregates, the information that underlies it. In the final section, we make some suggestions about what kind of knowledge we can hope for about material life in widely separated times and places.

The Wealth of the Kingdom

Efforts to measure the total size of the economy go back to the mid-seventeenth century. The first of these, according to histories of national accounts, is the 1665 effort of William Petty to calculate the total income of England.[7] Though Petty did not frame his estimate as a measure of production, he relied on the fundamental identity of expenditure with income—the total quantity of goods purchased in a year must equal the nation’s total income.[8] This double-sidedness is a fundamental feature of all GDP-like measures—they are understood both as quantities of money and as quantities of stuff that the money buys.

Petty’s initial efforts were taken up by Gregory King,[9] who among other things produced a table showing the income and expenses for 1688 of various ranks of the population, from temporal and spiritual lords through “persons in liberal arts and sciences” down to common seamen and vagrants. By his estimate, some 40 percent of the population—the higher ranks—had incomes greater than their expenses and were thus “increasing the wealth of the kingdom,” while the bottom 60 percent were “decreasing the wealth of the kingdom.”[10]

Calculations like these were aimed at two related policy questions. First, how much could taxes plausibly be raised? And second, could the country

sustain a war against a foreign rival?[11] Parallel efforts in France by Boisguilbert and Vauban were likewise motivated by the question of how much, and which, income could feasibly be taxed.[12] So were the first efforts to measure US national income or product. George Tucker, whose 1843 estimate seems to be the earliest of these, was particularly concerned with the question of whether state governments could raise enough taxes to service their European debts.[13]

This motivation shaped the structure and presentation of these early accounts. The idea that the incomes received by the lords temporal and spiritual represent their contribution to the wealth of the kingdom has an obvious ideological character. But it also reflects the practical consideration that if the government wants to raise taxes, it needs to know where the income is, so that it may be taxed. In particular, it was not about "progress" or living standards more broadly (which is the overwhelming purpose of calculating GDP today). National accountants have always rejected the idea that their constructs could be used to measure well-being or similarly amorphous concepts. William Petty was famously dismissive of what he called "intellectual arguments" and suggested that in discussions in the Royal Society "no word might be used but what marks either number, weight, or measure."[14]

GDP in its modern form—and the national accounts of which it is the centerpiece—similarly emerged to meet the urgent policy needs of the Depression, war finance, and postwar reconstruction. The immediate political impetus for the creation of the US system of national accounts came from the demands of the left-wing Senator Robert La Follette for better statistics to guide a vastly expanded public role in the economy.[15] The specific history is different elsewhere. But as Richard Stone emphasized in his 1984 Nobel lecture (he won the prize for his work developing the international system of national accounts), it is always the case that what you measure, and how, is inseparable from the purposes that you are measuring *for*.[16]

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The definition of GDP, as any introductory economics course will tell you, is the market value of all final goods and services produced in a country in a

given year. GDP is essentially double-sided—it is a flow of money that is understood as reflecting an equivalent flow of stuff that people want. What we observe is the spending—the only way we can measure the value of something is by what people will pay for it. But "total value" is not identical to total spending. It may also incorporate estimates of how much people *would* pay for something, if it were sold. A substantial fraction of what is counted as GDP is estimates of this kind.[17]

GDP is constructed by adding up money payments—actual or notional—which are understood to correspond to a quantity of stuff produced and purchased. But not all money payments can be understood this way. Both common sense and national accounting conventions agree that simply transferring a sum of money to someone does not in itself imply an equivalent value of output. Nor does a transfer raise income in the aggregate—your gain is my loss. "Your money or your life" is a kind of market transaction. But no one would suggest including the gains from robbery in GDP. The same goes for many activities that do not have a market price, but for which one might more or less plausibly be imputed.

These are all questions of the *production boundary*—which human activities fall within and which outside the boundaries of output. The questions here are, first, which payments do we think correspond to production, the creation of new value, as opposed to mere transfers? And second, are there value-creating activities that do not have associated payments, but which we can plausibly impute them for?

GDP can only be measured directly on the basis of market transactions. Nonmarket activities can be included only if a virtual "receipt" can be constructed—meaning those with close market equivalents, or those produced with wage labor and other market inputs. Owner-occupied housing and rental housing, discussed below, is the canonical example. Much of what we might regard as value-creating activity, however, takes place primarily or entirely outside of markets—even today, and more so in the past. Feminist economists have long called attention to the exclusion of household labor from GDP, activities that definitely constitute work and production, but not paid employment. Conversely, there are activities that use paid labor and other market inputs, but which we might doubt produce value in any substantive sense. (Everybody will have their own list of such nonproductive activities.)

The largest single imputation in the US national accounts are services from owner-occupied housing. A family may have the use of a dwelling in exchange for a market price—a rent—that they pay each month. Or they may have the use of a dwelling without any (direct) payment, because they own it. What value should we put on the latter? An owner's equivalent rent (based on the market rent of similar units) is constructed for owner-occupied housing, and an equal income is attributed to the owner. (The one unbreakable rule of national accounting is that for every expenditure there must be a corresponding income.) In effect, the national accounts treat homeowners as if they were renting their homes to themselves.

Imputations like these necessarily involve a judgment about what should be, or normally is, provided through the market. In the case of an owner-occupied home, the assumption is that if the owners weren't living in it, the house would be rented out at the market rent, and owners would have to rent similar accommodations for themselves. So people will be paying the market price for a place to live one way or another. This assumption is not unreasonable, but it is not the only possible one. We might instead assume that at the end of the day, houses are going to be lived in. In this case the rent paid to the landlord (apart from the cost of upkeep and improvements) would appear as a rent in an economic sense, or a transfer payment. If this were our default, then rather than *adding* an imputed owner's equivalent rent to GDP, we would *exclude* rental payments.

National accounts do not always assume a baseline of market provision. For example, childcare is a service that is sometimes purchased in the market but mostly produced by families' own labor. Should we have childcare-equivalent output added to GDP for the time parents spend caring for their own children? This possibility was considered by Simon Kuznets and his colleagues in their development of what would become the US National Income and Product Accounts, though they ultimately rejected the idea.[18] The answer depends on whether one thinks that market provision of childcare is in some sense the default, so that its market price is a good proxy for its value. And this in turn depends on where one draws the line between reproductive labor within the family and the world of money and commodities outside it—a line that can shift over time.

Early in the twentieth century, as middle-class women in the US moved into paid employment (many working-class women had always worked

outside the home), there was some pressure to normalize paid childcare as a necessary expense, like housing. When Lillie Smith, a young mother, entered the workforce in 1937, she and her husband sought to deduct their childcare costs from their income tax as a business expense but were denied. The Board of Tax Appeals eventually ruled against them, on the grounds that deductions were allowable for "the ordinary and necessary expenses [of] . . . a trade or business," but not "for personal, living, or family expenses." In its 1939 decision, the board wrote, "We are not prepared to say that the care of children, like similar aspects of family and household life, is other than a personal concern."[19]

The problem is hardly unique to childcare—from cooking and cleaning to all the varieties of care work that we do for each other, much of our unpaid activity has some equivalent market service. Even our leisure time can be seen as a substitute for purchases of paid entertainment. If you are wavering between using a free afternoon to see a movie or take a walk in the park, you are comparing two alternatives with similar value to you. But only one of them will contribute to GDP. One well-known effort to explore alternative measures of output concluded that unpaid household labor could add 80 percent to measured GDP, while unpaid leisure could add another 100 percent.[20] This exercise values an hour of leisure at the average wage for the country, on the assumption that people are trading off leisure and work; one could make different assumptions about the value of leisure time. Our point here is not that such adjustments get us closer to a "true" measure of output. It is the opposite, to show why this is a meaningless goal. Measurement of GDP depends fundamentally on normative judgments about what ought to be provided through markets.

The question of the production boundary is even more vexed in countries with a substantial traditional or informal sector, where a much wider range of production is carried out with household labor. In 1941 the British economic historian Phyllis Deane was tasked by the British government with developing national accounts for its colonies of Nyasaland, Northern Rhodesia, and Jamaica. After struggling with the problem, she concluded that conventional measures of income and employment were simply inapplicable; a meaningful account of economic activity in these areas would require developing new categories, based on "more comprehensive and direct knowledge of the social and economic structure."[21] The point is

that market prices cannot be used as measures of "value" in settings where most productive activity takes place outside of the market.

The producers of national accounts have always been conscious of these problems. Kuznets himself emphasized that any system of national accounts depends on "an underlying scheme of values or social philosophy."[22] The choice about what activities to include, he insisted, must be made on ethical as well as economic grounds—it requires an assessment of what *should* be paid for as well as what is. "For those not intimately acquainted with this type of work," he warned, "it is difficult to realize the degree to which estimates of national income . . . must be affected by implicit or explicit value judgements."[23] Today's national accountants might not use this exact language, but they are well aware that they are making choices based on a number of competing objectives, and not simply recording facts. The official guide to the SNAs includes a nuanced discussion of alternative places to draw the production boundary, with a frank admission that there is no single right answer. The problem is *not* that national accountants make more or less arbitrary decisions about what to classify where. There is no way to avoid that. The problem is that users of these statistics—especially but by no means only economists—treat them as direct windows into the material world.

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In addition to the production boundary, another ambiguity comes from the meaning of "final" production. Calculations of GDP exclude the costs of intermediate goods, on the sensible grounds that otherwise a production process that uses purchased inputs would result in double counting. If a restaurant pays $100,000 for food, rent, and utilities and sells $150,000 worth of meals, it has produced only $50,000 of value. So we cannot simply add the two sets of receipts; we should omit the intermediate steps and only use the last, or final, transaction.

But in the circular flow of money through the economy, which transaction is the last one? One fundamental convention is that purchases by households are the end of the line. Everything bought by families is for their own use and therefore contributes its full value to GDP; households do not purchase intermediate inputs. Not everyone agrees that this makes sense; there have been suggestions, for example, that the costs of

commuting to work should be subtracted from GDP, since they are a cost of production rather than something consumed for its own sake. (By the same token, one might achieve consistency between purchased and family-provided childcare by omitting the former, rather than including the latter.) Applying this logic consistently would require drawing a line between things people buy because they need them to earn a living, and things they buy for their own sake. This is not easy to do, even in principle. Reviewing various proposals to account for household intermediate purchases in GDP, the US economist Robert Eisner wondered, "Is eating itself intermediate to the creation and maintenance of human capital?"[24]

Current national accounting conventions do not include any intermediate inputs in the household sector except those associated with owner-occupied housing. But for businesses, the line between investment and costs of current production is a critical question. By the conventions of the national accounts (and common sense) production consists only of the excess of sales price over the cost of the nonlabor inputs. But this assumes that the inputs are fully used up in the current production process. If a business spends money to add to its production capabilities in future years, those costs should be treated as additional production and not netted out from its sales.

With tangible means of production, especially those with a well-established secondary market, this distinction is reasonably straightforward. The costs of building a factory are, in most cases, clearly marked off from the costs of operating it. But for the increasing share of output that is immaterial, and where production relies on intellectual property rather than tangible capital goods, it is trickier. When a movie studio produces a movie, do we think of the costs of production as being used up once the movie is released? Or is the movie itself a long-lived capital good, whose creation should be added to the total spending that makes up GDP?

Historically, national accountants gave the first answer, as private accounting standards generally still do—they counted costs of producing intellectual property as current expenses. But since 2013, the Bureau of Economic Analysis (BEA) has instead treated the costs of producing intellectual property as a form of investment. (A similar switch was made for software development in the late 1990s.) The 2013 change raised the level of nonresidential investment in the economy by 30 to 50 percent,

depending on the year. Since intellectual property spending has grown more rapidly than spending on tangible capital goods, the change affects not just the level of investment, but also its trend.

It's also worth noting that the relative ease of separating business investment (counted in GDP) from the costs of production (not counted) is not a fact of nature, but reflects the widespread practice of distinguishing these types of spending in business accounts, and the insistence on the distinction by investors, regulators, bankers, and other users of the accounts.[25]

The cases of owner-occupied housing and childcare involve questions of where we should impute payments as if something useful were being produced in the market. In effect, they are groceries that are in the basket, but without the corresponding receipt. The question of investment versus inputs, on the other hand, is a question of which observed payments should have corresponding production attributed to them. Here the receipt is present, but is it for groceries? Or is it perhaps an ATM fee?

ATM fees are, as it happens, a problem for the national accounts, as are financial services in general. There are very large payments to and from the financial system, and large incomes generated there. By the conventions of the accounts, where there are wages and profits, there must be production. But it is not obvious what is being produced.

After owner's equivalent rent, the largest category of imputations in GDP is "financial services furnished without payment." Essentially, the statistical agencies assume that when people receive less than some benchmark interest rate on their deposits, or pay more than the benchmark rate for a loan, the difference represents the purchase of some set of financial services, which are included in GDP. In the last decade, these imputed financial services have totaled close to $1 trillion per year, on the order of 5 percent of US GDP.

In reality, though, what the benchmark rate corresponds to is *not* the interest rate the bank's customer would receive (or pay, in the case of a loan) in some alternative world where they were lending or borrowing from some unspecified entity other than the bank, as the BEA procedure implies. Rather, it captures the interest rate facing the bank itself. The difference between the interest rate on deposits and the risk-free rate is not in any sense a measure of the services the depositor is receiving, but it *is* a good

measure of the bank's income from deposit-taking. This income, in turn, generates wages and profits, which are real from both a sociological and national accounting perspective. If some kind of output were not imputed to the financial sector, then value added there would be negative. As Duncan Foley suggests, avoiding this awkward result is probably the real reason for including imputed financial services in GDP.[26]

The inclusion of "financial services without payment" in the national accounts is precisely a way of attributing the bank's income to useful production. It is another peryton—the attribution of a monetary signal to some imagined material source. In this case the peryton's ideological function is unusually clear. National accounting conventions do not merely attempt to capture existing market activities. They construct an idealized image of market exchange behind the observable web of money payments.

One last—but important—example: the considerable spending, by both the public and private sector, on violence and coercion. In the 1940s, when the concept of GDP was first formalized, there was extensive debate over whether military expenditure should be included. Kuznets initially supported the inclusion of spending on police, prisons, and the military, analogizing them with the "private police used by many large corporations."[27] But he subsequently changed his mind, arguing that military spending should be included only in periods of total war, and that at other times a separate "peacetime GDP," which excluded them, should be used. Despite Kuznets's leading role in the construction of the accounts, he lost this fight. This was partly because to an ascendant Keynesian economics, the critical questions revolved around demand and employment, which were created by wasteful as well as useful spending. But more fundamentally, the suggestion that military spending was not productive ran up against a hardening Cold War vision of the US as the world's policeman. As the economist John Kendrick, who took the other side in this debate, insisted, "national security is at *all times* a prime objective of economic organization" (original emphasis).[28]

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The more one understands about the construction of GDP, the imputations and assumptions that go into it, and the historical debates around its shifting definition, the clearer it is that this cannot be regarded as a measurement of

a singular object that exists in the world. There is no such thing as “the level of output” of a given country for a given year. There are only various indicators one might adopt for various purposes.

That said, GDP remains quite useful for the two main purposes it is designed for—assessing the scale on which existing productive activities could be redirected by additional money payments, and measuring fluctuations in activity over the business cycle. Neither of these, importantly, requires comparisons of output over widely separated places and times.

Petty and King’s goal in the seventeenth century, assessing the feasibility of increased public expenditure and taxation, remains relevant today. When assessing the degree of economic adjustment entailed by a major new public outlay—a rapid transition away from carbon, say, or universal health care—the most natural starting point is the level of the proposed expenditure as a fraction of GDP. Total public spending relative to GDP typically falls between 40 and 50 percent in the rich countries, with a few outliers approaching 60 percent. In middle-income countries like India or Brazil, the ratio is usually in the range of 30 to 40 percent, while in very poor countries (where statistics should be interpreted cautiously) it may be below 10 percent. More importantly, these ratios are quite stable over time—if you want to know the ratio of public spending to GDP today, the ratio of twenty years ago will let you make a very good guess. This means the share of GDP is a reasonable guide to what kinds of changes to public spending or taxes would be plausible given a country’s current political arrangements, and what changes would be unlikely in the absence of some farther-reaching institutional change.

Related to this, GDP is useful as a scaling variable, a convenient measuring stick for other economy-wide quantities. Changes in an industry or activity that accounts for 5 percent of GDP are likely to have important consequences for the economy as a whole; changes in something that accounts for 0.1 percent of GDP are much less likely to, at least directly.

The most common use of GDP is probably what the BEA describes as a “comprehensive measure of economic activity” that people can use to gauge “how their economy is doing.”[29] GDP often functions well for this purpose—in many contexts, changes in measured GDP line up with a wide range of independently observable outcomes. Certainly a resident of, say,

Greece, would have no trouble correlating the rapidly rising GDP of the 2000s and falling GDP of the 2010s with very different experiences as an employee, business owner, and user of public services.

Among macroeconomists, GDP is used as a key input for explaining or forecasting other variables, such as employment; as a scaling variable for measuring other monetary aggregates (percent of GDP is perhaps the most common unit in macroeconomics); and as an all-purpose scorecard for evaluating economic performance and policy choices. “What is the likely effect on GDP?” is certainly not the only question one might want to ask about some macroeconomic policy choice, but it is usually one of them. Many of the choices that go into the construction of GDP reflect its use for this purpose, rather than first-principles assessments of what should count production. The 2008 system of national accounts, for example, explains that while the “care and training of children” and other forms of domestic labor ought, conceptually, to be considered a form of production, including them would destroy the relationship between measured output and measured employment and unemployment.[30] For this reason, this labor is included only when it is performed for pay.

The usefulness of GDP for these purposes, as well as for public budgeting, depends on a fairly regular relationship between different sets of money flows. In biology, the term “allometry” describes regular proportionate changes between the sizes of parts of an organism, or other measurable traits. For example, metabolic rate in animals normally increases with the 0.75 power of body mass (this is known as Kleiber’s law). Much of the practical usefulness of GDP comes from stable allometries between it and other macroeconomic variables, for instance with the unemployment rate (a relationship known as Okun’s law), the government budget balance (the fiscal multiplier), or imports. In the US, for example, 1 percentage point of additional GDP growth is typically associated with a 2 percent increase in imports—a relationship, incidentally, that explains trade flows much better than shifting exchange rates do. While they are not derived from first principles (and are therefore viewed with suspicion by economic theorists), these relationships are often stable enough within a given country to be useful guides for policy and for economic forecasting.

The same regularities that make GDP a useful guide to the state of the economy mean that many other indicators would work as well. When economists at the New York Fed explored alternative measures of GDP (adding women's labor in the household, assuming the same productivity growth for public services as in the private sector, and so on), they concluded that while a number of reasonable changes might have substantial effects on long-term growth rates, they would not affect the measure's use as a short-run indicator. In the mid-nineteenth century, William Stanley Jevons (an important early theorist of utility as the standard of value, but also a keen observer of business fluctuations) constructed a measure of trade conditions based on volumes of construction materials—tons of brick made and loads of lumber imported.[31] Given the limitations of data at the time, and the centrality of construction to business cycles (then as well as now), it was probably as good a measure as any.

This substantive, as opposed to formal, content of GDP depends on, first, the dominance of market production in the society in question and, second, the stable composition of that activity over time. Adding up the receipts from my recent shopping trips is a reasonable guide to how much of various items you are likely to find on my shelves—but only if I get most of my food at the grocery store, and the mix of what I buy doesn't change much from month to month.

It is harder to construct a general measure of activity in settings where market production is less central. We often—and rightly—think of this in terms of the lack of meaning of GDP as applied in developing countries where household production is a larger share of activity, or retrospectively to precapitalist societies. But there are also ways in which market production becomes less important over time in advanced countries. For example, variation in life expectancy is clearly correlated with measured GDP across poor countries, but uncorrelated across richer countries. After a certain point biological survival becomes less dependent on market income, not more so. Both critics and admirers of capitalism are very conscious of the ways in which it tends to commodify different aspects of human existence. We are much less aware of this sort of decommodification—a theme we will return to in this book's final chapter.

Even in settings where markets are well developed and the mix of concrete productive activities is reasonably stable, GDP has pitfalls as a

general measure of activity. It is a statistical construct, not an object existing in the world, and as such involves unavoidable choices about definitions and measurement. For example, when comparing a country or period with declining population to one with growing population, GDP per capita will look quite different from GDP. (This has been widely discussed in the context of Japan but is becoming a more general issue with aging populations.) Which measure is relevant depends on the question being asked.

GDP is best thought of as the sum of money payments, or income, associated with production. This is a very helpful measure to have in an economy organized around wage labor and private property, where new undertakings will require hiring away factors currently being paid to do something else. The problem is when this genuinely useful aggregation of money flows gets diverted by the hunt for the will-o'-the-wisp of "real" output or production. Barry Cynamon and Steve Fazzari have shown that a full fourth of US consumption (the largest component of GDP) consists of imputations rather than observable money payments.[32] While many of these imputations may be reasonable for some purposes, on balance it is likely that they weaken rather than strengthen the relationship with other observable aggregates like employment or the trade balance. Better to measure the things we can measure than to make up numbers for things we cannot; worst of all is to mix up the two.

Nonetheless, as an aggregate of money payments—the receipts in the basket—GDP is conceptually well defined. If used with appropriate caution, it is a valuable guide on a wide range of economic questions. The same cannot be said for the various measures of "real" GDP. Tricky as the problems are with defining and measuring GDP in terms of money, they get much worse when it is a question of defining it in terms of something else.

The Mirage of the Real

The term "real" is one of many in economics that functions to link theory to observable reality by a confusion of language—a sort of argument by homonym, in which an everyday meaning is more or less deliberately mixed up with a technical one. (There is a long list of such terms, including what the legal scholar Sanjukta Paul calls the "foundational Borkian

homonyms" of law and economics: competition, welfare, and efficiency.)[33] "Real," to an economist, means a money quantity that has been divided by a price index. But it also means, implicitly, a physical, material quantity—there is a reason why the term "real" is used and not something more neutral like "inflation adjusted." It is "value," in some sense, as distinct from mere price. It is also used to refer to the fundamentals of the economy, the technical possibilities of production and human needs to be satisfied, imagined in biophysical terms and definitely excluding money and credit. "Real" to an economist is the antonym of "nominal," of "monetary" or "financial," and also of "unreal"—or at least, unimportant.

"Real GDP" operationally means a sum of payments divided by a price index. But it is also, implicitly and sometimes explicitly, used to mean a physical, material quantity, a "volume," of which the aggregate money payments is only an imperfect measure or representation. Unfortunately there is no way to aggregate prices and obtain a number that captures these broader meanings. In everyday usage, "real" gross domestic product is imagined as a given amount of generic "stuff" that exists independently of its measurement in terms of money. But this view, though it informs a widespread folk economics, falls apart as soon as we ask what this "stuff" is, and how it could be measured except via its price. It is certainly possible to construct a price index and divide various money values by it. But the resulting quantities cannot be regarded as "real" in any ontological sense.

Human activity has an endless variety of outcomes, each of which can be measured only in its own units. Under capitalism, many of these can be compared using a single metric, the market price. These prices are not qualities of the commodity itself but come into being only in the process of market exchange. They depend on all the social and institutional factors that set the terms on which exchange takes place, which vary between times and places. There is no physical quantity of output, only a set of market prices set by a particular pattern of consumer demand, relations of production, market structure, financing conditions, and so on.

These considerations are, on some level, familiar to almost anyone who works with GDP data. But it is normally waved off as a philosophical question that can be ignored in practice. Real GDP is measuring a quantity of *something*; knowing exactly *what* is unnecessary for the purposes it is put to. The attitude of most economists toward these questions is well

captured by an exchange one of us had on a walk in Trento with Axel Leijonhufvud and one of his most famous students. The student had at one time devoted a great deal of work to the Cambridge capital controversies, the famous intellectual battle about the measurement of capital discussed in chapter 3. But now, he said with some exasperation that he had given up on all that. When anyone raised the question of how to measure capital now, he just said, "Just tell me how *you* want to add it up, give me a number. And then let's move on."

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H. Spencer Banzhaf begins his comprehensive overview of debates around price indexes with the observation that "most economists today are likely to define a price index . . . in explicitly utilitarian terms," as the change in money income "required to hold utility constant in two different scenarios."[34] This conception has guided the construction of indexes only since the late twentieth century. But the idea that money values represent some underlying nonmonetary quantity is a very old one.

A version of the quantity theory of money can be traced back to at least the sixteenth century, with several figures associated with the Prussian court who were attempting to understand the "price revolution" of the times. In the early modern period, bullion-based commodity money played an important role in payments, and it was natural to link the import of specie from the New World to the sharply rising monetary values of commodities —"l'encherissement de toutes choses," in the words of Jean Bodin, perhaps the first to clearly articulate it.[35] Strictly speaking, the quantity theory requires not only the argument that Bodin made—that abundant silver and gold lead to higher prices—but the stronger claim that the changes should be proportionate—a doubling of the money supply should lead to a doubling of all prices. At that point, one has in effect postulated a set of real economic quantities that exist prior to their measurement by money.

The search for an invariant standard of value was a central concern of the classical economists. All of them settled on labor, but in different forms. As Smith put it: "The real price of everything . . . is the toil and trouble of acquiring it. . . . The same real price is always of the same value; but on account of the variations in the value of gold and silver, the same nominal price is sometimes of very different values."[36] Smith and Malthus took a

“labor commanded” view in which the value of a commodity was equal to the amount of labor it would exchange for. Again quoting Smith: “Equal quantities of labour, at all times and places, may be said to be of equal value to the labourer. . . . He must always lay down the same portion of his ease, his liberty, and his happiness . . . whatever may be the quantity of goods which he receives in return for it.”[37] By contrast, Ricardo, and later Marx, took a “labor embodied” view in which the value of a commodity was equal to the amount of labor it took to produce it.

Besides the obvious problem that market prices can deviate from costs for many reasons—a fact that all these writers were well aware of—this just pushes the problem back to measuring a quantity of labor; but labor, like the commodities it produces, is heterogeneous. Here Marx offered a solution: the tendency of capitalist production to reduce all productive activity to interchangeable, deskilled labor. His version of the labor theory of value, unlike those of the other classicals, describes a tendency under historically specific circumstances, rather than a universal truth. But even if all wage labor is eventually reduced to equivalent unskilled labor—a process that is nowhere universal or complete—there is still, as Piero Sraffa emphasized, the insurmountable challenge of “dated” labor.[38] The problem is that labor is applied not only directly but indirectly via the production of capital goods. This problem—in the form of the “standard commodity” in Ricardo’s system—was struggled with by both but remains unresolved. Ricardo eventually concluded that it was unresolvable: Unless all goods were produced with equal proportions of labor and capital, there was no consistent measure of value.

Be that as it may, the idea of labor as an invariant standard fell out of fashion with the marginal revolution in economics, which elevated consumer preferences to an equal footing with production costs as a determinant of value. For more doctrinaire marginalists, it displaced them entirely. Equal value now meant equal *utility*.

The idea of utility as the standard of value came primarily—as it has continued to—from the side of economic theory. But it also reflected a recognition of the difficulty of measuring prices when the composition of output was changing. The facts that goods improve in quality and that new goods arrive on the scene all the time, especially through trade, were explicitly recognized by the late nineteenth century. Already in 1883, the

year Keynes was born (and Marx died), Henry Sidgwick was proposing the approach that would come to dominate a century later. Noting the challenges posed to measurement by these facts, he suggests the following: "Here again there seems to be no means of attaining more than a rough and approximate solution of the problem proposed; and to reach even this we have to abandon the prima facie exact method of comparing prices, and to substitute the essentially looser procedure of comparing amounts of utility or satisfaction."[39] Sidgwick at least is clear that the comparison is necessarily "looser," more inexact.

Others were less ambivalent. Stanley Jevons, one of the central figures in the development of the utility-based conception of price indexes, was unequivocal that "value depends entirely upon utility," which in turn he defined as the "quantity of pleasure produced" by a given commodity—a quantity that could, in principle, be measured and calculated with just like any physical quantity.[40] A vivid statement of this perspective comes from Jevons's contemporary Francis Edgeworth, who imagines

> a psychophysical machine, continually registering the height of pleasure experienced by an individual. . . . From moment to moment the hedonimeter varies; the delicate index now flickering with the flutter of the passions, now steadied by intellectual activity, low sunk whole hours in the neighbourhood of zero, or momentarily springing up towards infinity. The continually indicated height is registered . . . upon a uniformly moving vertical plane. Then the quantity of happiness between two epochs is represented by . . . the curve traced by the index . . . extended from the present to the infinitely future time.[41]

Not every classical economist was quite so literal in suggesting that utility could be treated as a measurable physical phenomenon. Edgeworth himself was certainly aware that no such "psychophysical machine" existed. But the conception of a meaningful quantity of well-being—of "ordinal utility" in the economics jargon—was essential to the classical idea of utility as a standard of value.

The idea that money prices are merely the superficial appearance of underlying nonmonetary quantities is a central part of the body of thought

that Keynes was struggling to find his way out of in the 1920s and 1930s. The price level as such, however, plays a surprisingly small part in *The General Theory*. While he rejects the conventional distinction between real and nominal quantities, for the most part he tries to avoid the problem by working in terms of the average wage or "wage-unit."

He engaged more fully with the question in earlier writings, including in *A Treatise on Money*. There he directly challenged the idea that there is any underlying nonmonetary standard of value. He criticized the classical economists for their misguided search for "what they might describe as the value of money as such," saying, "I have long believed that this is a will-o'-the-wisp, a circle-squaring expedition." The idea of a general price level, he wrote, "is the result of a confusion of thought. . . . There is no moving but unique centre, to be called the general price level . . . , round which are scattered the moving price levels of individual things. There are all the various, quite definite [individual prices]. . . . There is nothing else. Jevons was pursuing a mirage."[42]

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Price indexes meanwhile have their own, largely independent history. It's important to stress here that there is no logical connection between the construction of a price index and the notion of some "real" nonmonetary quantity. For most of their history, index construction was not based on that idea. We can simply be interested in measuring prices as an object in themselves. This simply requires specifying some particular basket of commodities whose prices are to be included. It can be challenging to pick a basket in periods where the mix of expenditure is changing rapidly. But as we'll see, the utility-based approach faces the same challenge, while adding deep conceptual problems of its own. In any case, before the late twentieth century the construction of price indexes owed little or nothing to ideas of utility, or indeed to economic theory at all.

The first price index seems to have been produced in 1764 by the Italian G. R. Carli, who used an index of grain, wine, and oil prices to examine the effect of New World gold and silver on European prices.[43] During the American War of Independence, Massachusetts used price statistics to adjust payments to its militia.[44] The index was a very simple one, with only four commodities—corn, beef, wool, and leather, each receiving an equal

weight. This may nonetheless be the earliest example of wage indexing—the primary use of price level measurements through most of their history.[45]

Wage adjustment remained the main use case for price indexes until the growth of macroeconomic policy after the Second World War.[46] The development of price indexes typically came in the context of labor disputes, which often hinged on whether wages were keeping up with the cost of living. In the United States, a number of state statistical bureaus were established in the nineteenth century in response to labor disputes, often at the request of unions that wanted more accurate statistics on the cost of living. Both the Knights of Labor (in the 1870s) and the American Federation of Labor (in the 1880s) included the establishment of a national labor statistics bureau in their inaugural list of demands. When the federal government finally established the Bureau of Labor Statistics (BLS; under the leadership of Carroll D. Wright, the former head of the Massachusetts state labor bureau), it found little constituency for its products outside of organized labor. Price indexes were viewed with disinterest, skepticism, or even hostility by other government agencies, business owners, and the nascent economics profession. After twenty years at the helm of the bureau, Wright reported that the only concrete application he had found for his price data had been adjusting wages during his arbitration of a 1902 coal strike.[47]

It is not surprising, then, that the expansion and systematization of price indexes came with World War I, which saw both intensified labor conflicts and a more direct state interest in their peaceful settlement. The initial version of what would become the consumer price index (CPI) was produced during the war for the use of the Shipbuilding Labor Adjustment Board, which had the job of setting wages in the shipyards. By 1919 the BLS was producing regular price indexes for major American cities, and the national index from 1921. The war years saw the beginnings of official price indexes in much of the rest of the world as well—the first official British index was published in 1914, for example—and these efforts were coordinated by the International Labour Organization (ILO) after the war.[48]

These early indexes had, at best, an ambivalent relationship with economics; their construction was guided more by the practical exigencies of wage adjustment and measurement than by any consistent theory. On the other side, price indexes played a limited role within economics until well into the twentieth century. This was in part because of a lack of the

necessary data, but also because they were explicitly rejected by many economists. Von Mises and Hayek, among the founders of the Austrian tradition in economics, began their professional careers as collators of business cycle data, including price levels, but came to reject "index-number knowledge" on principle, in large part because of its link to efforts at state management of the economy.[49] The use of price indexes by the government was dangerous, Mises warned, because it suggested that "the manipulation of purchasing power is . . . a legitimate concern of currency policy"—a view he categorically rejected.[50] The movement of index numbers to center stage required the convergence of a theory that could guide their construction with an activist policy that had a need for them.

In the US, the formative economic debate around price measurement ran along lines defined by Irving Fisher at one pole and Wesley Clair Mitchell at the other. Two of the most important economists in the early twentieth century, both were heavily involved in the development of price indexes. Both firmly rejected the idea of utility as a guide to price level measurement. Fisher believed trying to base economic concepts on utility was "as fatuous a quest as the search for the philosopher's stone" while Mitchell emphasized social determination of consumption patterns.[51] Where Fisher agreed with (largely British) classical economists was that there was such a thing as "the price level," with a definite value that could in principle be measured. Mitchell and his students—who included many of the officials who developed US price statistics—by contrast insisted that there could only be price indexes for particular baskets of goods, with the relevant basket depending on the problem at hand.

Mitchell was, at least initially, more successful in shaping the design of official price level measures. But it was Fisher who had a more decisive impact on the economics profession. Writing thirty years after their 1920s debates, Joseph Schumpeter could call Fisher's 1922 *The Making of Index Numbers* "the fountainhead of almost all the best later work."[52]

Fisher was interested in how to pick between the various methods to convert various prices into a single index. He compared a great many formulas, including the Laspeyres index, which, when comparing prices across two years, uses the first year's basket for weights; the Paasche index, which uses the second year's basket; and his own preferred index (which he boldly termed the "ideal" index), a geometric average of the two. It is

probably Fisher as much as anyone else who is responsible for index construction becoming a staple of undergraduate economics education—as Schumpeter observes, “a student can no more go through any complete training in economics without hearing of Laspeyres than he can without hearing of Adam Smith.”[53] The Paasche index says how much it would cost in 2022 prices to buy the 2023 basket. The Laspeyres says how much it would cost in 2023 prices to buy the 2022 basket. And the “ideal” index splits the difference. Such indexes require using the basket of a definite year or set of years; one can then chain these together to get a longer price index.[54]

For Fisher, the point of the indexes was to find something like a center of gravity of various individual price movements. Writing in the aftermath of the First World War, he put it thus:

> If we look at prices as starting at any time from the same point, they seem to scatter or disperse like the fragments of a bursting shell. But, just as there is a definite center of gravity of the shell fragments, as they move, so is there a definite average movement of the scattering prices. This average is the “index number.” Moreover, just as the center of gravity is often convenient to use in physics instead of a list of the individual shell fragments, so the average of the price movements, called their index number, is often convenient to use in economics.[55]

It is worth digging into this metaphor a bit. There is a reason why the velocities of the fragments have a definite center. It’s because they share a common origin, the shell from which they exploded. Thanks to the conservation of momentum and energy, a sufficiently precise measurement of the fragments could tell us the position and velocity of the shell when it burst, and the force of the explosion. The properties of the subatomic particles discovered in colliders are calculated in exactly this way. (There are other conserved properties in that case as well.) But this is a fact about fragments from an explosion, not about measurement as such. You could, if you wanted, record the velocities of all the objects in your vicinity. With clear definitions of what counts as an object and how big your vicinity is, this would give you a definite value. This value would be objective, in the

sense that given the procedure you followed, you couldn't have gotten anything else. But it wouldn't *describe* anything, except the choices you made in calculating it.

For Fisher, there was an equivalent of the exploding shell and the law of conservation of momentum: the quantity theory of money. Fisher was the leading American exponent of this idea. If M is the quantity of money, V is its velocity of circulation, P is the price level, and Y is total output (or equivalently, expenditure on produced goods and services) then $MV = PY$ (this later was called the Fisher equation). If we further assume that V is a technologically determined constant (necessary if the theory is to be more than a tautology) and Y is fixed by the real productive capacity of the economy, then M and P should change in strict proportion. Fisher's interest in the correct procedure for measuring the price level came from his prior commitment to this theory. As he experimented with various ways of constructing indexes, he was searching for the best way of finding an object that he had already determined, based on first principles, must exist. If there was a definite quantity of money, and if it stood in a definite relationship to prices, then there must also be a definite price level.

We can see this again in another, more pacific metaphor he used in correspondence with Mitchell, defending his search for "the" price level against Mitchell's insistence there were only particular prices. Any notion of equilibrium, Fisher admitted, is "always 'imaginary' speaking strictly and absolutely. Greensboro Lake is never without a ripple even when you cannot see them. Therefore the theory of a water level is purely ideal and imaginary! . . . [But] unless the perturbations caused by the wind are very great you rely upon the approximate fulfillment of the water level theory or you would never trust yourself to the boat."[56] Fisher's point is that his "quantity theory" of money is as commonsensically descriptive as the "water level theory" of a lake. But the fact that there is a meaningful water level is not simply a statistical fact; it reflects the way fluids behave under the influence of gravity. If you add more water to one end of a lake or pool, it will spread out and raise the water level by an equal amount everywhere. The same principle does not apply in the mountains, or in a city. If you put up a tall building at one end of a street, no equilibrating process will raise the ones at the other end. The behavior of prices might, in principle, resemble the height of water in a lake. Or it might resemble the height of buildings in a city. Fisher is here trying to smuggle in a substantive claim as

if it were a methodological one—a sleight of hand all too common in economics and perhaps especially common in discussions of the price level.

There was an important political dimension to Fisher's commitment to the quantity theory. As he himself stressed, it was intended as a tool to combat arguments that looser credit or a more flexible money supply could spur growth and development. By postulating a tight link from *M* to *P*, the quantity theory had the desirable property of making monetary policy very important for stabilizing prices, but useless for any other purpose. Here we see a central theme of this book: The belief in an underlying nonmonetary or "real" economy is the flipside of a belief in the impotence or irrelevance of money and credit.

As the leading figure in the now near-vanished but then ascendant school of institutional economics, Fisher's rival Mitchell was interested in *prices*, plural, rather than in the price level. He saw measuring prices as an end in itself—they were the raw materials about which theories might subsequently be developed, rather than noise around an already defined theoretical object. Mitchell also spent much more time than Fisher engaging with concrete administrative and policy problems. For him, the most important problem in constructing price indexes was not the specific procedure used to average various prices, but the challenges of collecting the price measurements in the first place.

Even for individual commodities, Mitchell stressed, there was seldom such a thing as "the" price: "Varying grades command varying prices, and so as a rule do large lots and small lots; for the same grade in the same quantities, different prices are paid by the manufacturer, jobber, and local buyer; in different localities the prices paid by these various dealers are not the same; even in the same locality different dealers of the same class do not all pay the same price to everyone from whom they buy."[57] Mitchell and his fellow institutionalists rejected the idea of the price level as something whose true measure could be found or computed, even in principle. Price indexes were useful tools, essential for any system of automatic wage adjustment, and important for assessing the overall level of activity in the economy. But they were fundamentally heuristics, which should be tailored to the particular purpose they were intended for. In the words of Mitchell's student Willford King, "it is no more reasonable to suppose that one index number can be found which will meet all demands

in the best possible manner than it is to assume that a formula can be found which will solve all problems in arithmetic."[58]

In the setting up and extension of official US price indexes, it was initially Mitchell's views and not Fisher's that prevailed. If the goal were to measure the price level as such, it was important to continuously update the basket of goods in the index—thus Fisher's "ideal." But if the goal was simply measuring prices, then it was essential to hold the basket constant, so that changes in the index represented only changes in prices, rather than a mix of price and composition changes. With a constantly changing basket, the BLS officials complained (very reasonably) that it was no longer clear what the index was measuring the average price *of*. Their view was that only an index based on a fixed basket could properly be considered a price measure at all.

As price indexes were developed around the world in the interwar period, Mitchell's approach seemed to have won out. By 1925, the ILO could write as a settled consensus that "the items in the budget and the weights must remain unchanged during the whole period covered by the index numbers."[59]

Another implication of the Mitchell view was that there was no reason to try to make the basket comprehensive. Since the index was only an indicator anyway, it was better to limit it to goods where prices were well defined, easy to observe, and not subject to wild swings. In the case of goods where price differences often reflected hard-to-measure quality differences (a category that in this period included fresh fruit and vegetables), the best solution might be to just leave them out.

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Debates about inflation measurement in the US (and elsewhere) became more heated and more directly political during the Second World War, as a large fraction of workers found their wage increases calculated based on measurement of the cost of living. The question of whether one index was suitable for all purposes became especially acute, as prices rose more rapidly in major manufacturing cities, and as the index came to be used for macroeconomic management as well as for wage indexing (which however remained its primary purpose).

In an interesting contrast to present-day debates, it was labor representatives who argued that inflation was understated, and who pushed for a more expansive definition of price changes. For labor representatives, the purpose of the price index was to measure changes in the cost of maintaining a certain material standard of living. From this point of view, if, for example, a less expensive version of some product was discontinued (as was common under wartime restrictions) so that buyers had to switch to a more expensive version, that was an increase in the cost of living, even if no individual article had changed price. Similarly, when people relocated to more expensive cities for work, that was an increase in their cost of living, above and beyond the faster rise in prices there.

This perspective was forcefully expressed by future AFL-CIO president George Meany, then serving on a national commission to improve price measures. He argued that a true cost of living index should not just summarize price changes, but also take into account changes in "living habits" resulting from war conditions, such as increased transportation expenses and the higher cost of housing in war production centers.[60] Wartime changes in consumption norms—an increased proportion of meals eaten in restaurants; laundry done commercially rather than in the home—should also be reflected in the index, labor representatives insisted.

Meany lost this debate; the official conception of a price index continued to be a measure of the average price change of a given basket of goods, rather than the change in the cost of achieving a certain material standard of living. To underscore this point, it was in response to these kinds of criticisms that the name of the BLS's headline index was changed from the "cost of living index," as it had been in its first few decades, to the "consumer price index," as it remains.

We bring up this episode to highlight the importance of asking *what a price index is measuring*. The general price level is not, in itself, a well-defined concept, and a fortiori neither is the level of real income or output. The various choices that go into index construction can't be settled by methodological first principles but depend on the purpose for which the index is to be used.

The cost of living index demand by labor was quite different, conceptually and in its behavior, from the index of a definite basket of goods preferred by Mitchell and the BLS, which was different in turn from

Fisher's price level corresponding to the quantity theory, which was different again from the utility-based conception preferred by the classicals and which would play an increasing role in the later evolution of the CPI. In an abstract economic model it makes no difference. The price level is the price level, and you don't need to worry about how you measure it. To most economists, asking, "How is that measured?" in the context of a formal model would seem like a category error. It can be measured however you want—that's not the point. "Just give me a number," as our friend said.

But as soon as the model comes into contact with the world, it makes a big difference. Even sticking to the basic questions of averaging procedures that Fisher focused on, the differences between methods can be surprisingly great. This is common knowledge to the professional index makers. The ILO's manual on price indexes provides a striking example. Using a typical set of price data for a five-year period and experimenting with different averaging techniques, they find that "the Laspeyres index . . . registers an increase of 44 per cent while the Paasche falls by 20 per cent. The two commonly used superlative indices, Tornqvist and Fisher, register increases of 25 per cent and 19 per cent respectively. . . . These results show that the choice of index formula and method does matter."[61] This is a rather understated way of saying that the price level and corresponding "real" gross domestic product (or "real" consumption or anything else) might rise, fall, or stay the same, just by choosing a different (and perfectly respectable) index with which to measure it.

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Economists today, if pressed to give a rigorous definition of what a price index is measuring, would fall back on utility. On an intellectual level, the reassertion of utility as the basis of price comparisons has required a subtle mutation in what a utility-based price index was understood to mean. For earlier adherents of the utility view, the question was, how much well-being does the basket of goods consumed in one period deliver, compared with the basket of goods in an earlier period? But this question, most recognized, was fundamentally unanswerable, at least in the absence of Edgeworth's hedonimeter. When utility was reestablished as the basis of price index construction in the later twentieth century, the question was instead, how

much money would it take in the later period to get a basket of goods at least as satisfactory as the one in the earlier period?

The two questions might sound similar, but there is a critical difference: The second requires no direct measurement of utility. It can be described in terms of a choice that is, in principle if not in practice, observable: Given the option of either this much money in this setting or that much money in that setting, which one would a typical consumer pick? A price index tells us how much more money we have to give the consumer to leave them just indifferent between the two choices.

This reconceptualization of a price index is part of the larger shift toward thinking of utility in ordinal rather than cardinal terms, as a way of describing the choices that people are observed to make. This allowed the new concept to link up with the reformulation of economic theory around rational choice, and introduced the possibility, in principle, for the construction of a utility-based price index from observed behavior. Interestingly, the originator of this approach to price indexes was a Soviet economist, Alexander Konüs, who worked in the Russian counterpart to the National Bureau of Economic Research, the Moscow Business Cycle Institute.[62] (The institute was headed at the time by Nikolai Kondratieff, known today for his analysis of long waves of growth in economies.) It was Konüs who formalized the idea of the price index as the ratio of expenditures needed to hold utility constant under the prices in two different situations; once his work was translated into English, it was widely influential among Western economists. His method relied squarely on the theory of the rational consumer and placed the welfare of the consumer at the center of the analysis. Konüs's approach has been termed—with typical imperialism—the "economic approach" and has been the anchor for thinking about indexes among economists since.

In the US, the first step toward reconceptualizing price indexes on the basis of utility came with the 1961 committee on price index reform led by George Stigler of the University of Chicago.[63] The constant utility concept was reasserted and extended by another commission, led by Michael Boskin, some two decades later.[64] It is important to stress that this victory was incomplete, and remains so. However they may be presented, national accounting statistics are never simply the application of a set of consistent principles. They are political creations, embodying compromise at each

moment, and have enormous institutional inertia, so are a palimpsest of various theories and techniques superimposed on each other.

Nonetheless, the tendency toward utility-based concepts was real and important, both in the ways that the indexes were discussed and, to a lesser but increasing extent, in the way that they were constructed. In particular, the idea of hedonic price adjustment for rapidly changing products, which seeks to break the price of the good into the various qualities desired by the consumer, was introduced by Zvi Griliches in the 1961 committee and has been applied to a widening range of products since then.

As the historian Thomas Stapleford observes, the fundamental goal of the constant utility approach was to build "a conceptual link between macroeconomic statistics and the neoclassical theories that had come to dominate American microeconomics."[65] The essential thing was to have a system to allow for, in principle at least, the mapping of the numbers produced by national statistical agencies onto the concepts employed by theoretical models.

It is harder to be confident about the sources or consequences of the utility concept from the political and administrative side. Certainly it is advantageous in any debate around economic policy or economic statistics to be making an argument that cuts with, rather than against, the grain of theory. Occasionally we can see signs of a direct political interest. Stapleford offers the case of IBM, which used hedonic pricing in its defense against antitrust prosecution (to show that its prices had not risen as much as the government claimed) before offering its expertise to the Department of Commerce to apply a similar approach to the measurement of computer prices in general. But such cases of direct interest in measurement are rare. And even in this case, it's far from clear how much IBM's specific influence mattered.

This brings up an important point. We have argued, throughout this chapter and much of the rest of this book, that economic concepts and measurements must be seen in political terms, as arising from and lending support to particular ways of organizing our collective activity. But it is almost always a mistake, in our view, to trace this connection directly from a particular official or interest group to a particular number. The point is not that some number is made to go up or down to serve some immediate

interest; rather, it is that measuring the world in a particular way determines how we see it and what seems possible and impossible.

The power of economic statistics over our thoughts and actions comes precisely from the fact that they are not constructed to meet the immediate needs of the powerful—they are not mere propaganda or lies. It is only because they are constructed on a logically consistent set of principles, and careful observation of external reality, that they are useful to those in power, both instrumentally and ideologically.

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However theoretically satisfying a utility-based approach to price indexes may be, it does not make the job of constructing them any easier. It is true that it solves the problem of what a price index means when the basket of goods is changing. (Mitchell's concept, recall, was that a price index is meaningfully defined only for a fixed basket of goods.) But it substitutes for the constant basket of goods the constant preferences of the representative consumer. We have solved the problem of "prices of *what* exactly?" that plagued the earlier approaches only by introducing a new problem of "choices by *who* exactly?" The approach requires that everyone in both periods have the same preferences or, equivalently, that society be imagined in terms of a single representative consumer. This consumer's preferences, furthermore, must be *homothetic*—they must consume goods in the same proportions regardless of their income. Otherwise there would be a different set of price levels for each income level. A whole host of practical measurement problems, meanwhile, exist whatever the definition.

To see the restrictiveness of the current concept, consider the definition of the CPI from the official manual:

> In order to qualify as a CPI, a COLI [cost of living index] must therefore hold constant not only the consumer's preferences but all the non-price factors that affect the consumer's welfare and standard of living. If a CPI is intended to be a COLI it must be *conditional* on:
>
> —a particular level of utility or welfare;
>
> —a particular set of consumer preferences;

—a particular state of the physical and social environment. . . .

> The observed expenditure of a rational consumer in the selected base period may be assumed to be the minimum expenditure needed to achieve the level of utility enjoyed in that period. In order to calculate a COLI based on that period, it is necessary to know what would be the minimum expenditure needed to attain precisely the same level of utility if the prices prevailing were those of the second period, other things remaining equal.[66]

This is not simply a procedure for summarizing observable price data. In the real world, there are many individual purchasers, whose motivations for choosing this thing rather than that one change for any number of reasons. Even for a given buyer at a given moment, there is no reason to think that their choices reflect the unique solution to an optimization problem, or behave in practice as if they were. Changeable circumstances inform every purchasing decision, and the individuals making those decisions are not the same from one period to the next.

The last point is the decisive one on the plane of logic. A Mitchell-style price index measures the change in price of a given basket of goods, a well-defined matter of observable fact, whether or not it is the answer to the question we are interested in. The constant utility formulation simply substitutes a single set of preferences for a single set of goods. So the loss of concrete referent is not offset by any gain in generality.

The assumption of identical preference functions is not just absurd under any observable meaning of “preferences”; it creates problems even at the level of pure theory. After all, the existence of different preferences is central to other economics 101 fundamentals, including the normative justification for the existence of markets in the first place. If every good provides the same satisfaction to everyone, then it doesn’t matter how they are allocated. So why bother trading? Already 140 years ago, Alfred Marshall understood the problem clearly:

> A perfectly exact measure of purchasing power is not only unattainable, but even unthinkable. The same change of prices affects the purchasing power of money to different persons in different ways.

> For to him who can seldom afford to have meat, a fall of one-fourth in the price of meat accompanied by a rise of one-fourth in that of bread means a fall in the purchasing power of money; his wages will not go so far as before. While to his richer neighbour, who spends twice as much on meat as on bread, the change acts the other way.[67]

In the 1930s, the ILO rejected the idea of constructing price indexes around the assumption of constant utility, because of the required "assumption of identical tastes and milieu," as ILO economist Hans Staehle put it.[68] In response to the 1961 Stigler commission, labor economist Lazare Teper similarly criticized the assumption that consumers "do not acquire new tastes, do not change their environment, and do not age, and they are totally resistant to advertising, salesmanship, and emulation of their neighbors."[69]

These points are hardly controversial, even today. Few economists would want to defend the idea of a single set of preferences guiding all consumer goods purchases over all time. They would, presumably, say that the assumption is just an abstraction, a simplification, or approximation. But this leaves open the question of what underlying reality is being abstracted or simplified. On the other side, many economists—and almost all noneconomists—would agree that the question, "How much more money would a person need to get as much happiness in 2023 as some money gave them in 2003?" is meaningless and unanswerable. It depends, obviously, on which person and how much money, and anyway happiness is not measurable in that way. Yet most of those people will happily talk about "real GDP" in the two years, without realizing (or caring) that this is exactly that question that it purports to answer.

*

The main cost of the utility-based conception of price indexes is, perhaps, that it occupies the space where some other rigorous and systematic analysis of price indexes might go, one that actually engages with the questions of what we can know about prices and what we want to do with that knowledge. But the conceptual basis does sometimes show up in the numbers themselves.

In the real world, prices are much easier to measure than quantities. (To know the price of a box of Cheerios at the grocery store, it's sufficient to observe one purchase; to know the quantity sold, you have to observe all of them.) So weights are updated less frequently than prices. In the US, the prices in the CPI—the most widely used price index—are updated every month, while the weights are updated every two years; prior to 2002 weights were updated only every five to ten years.

The UN recommends ten years as the minimum frequency for updating weights, but in many poor countries, where resources for data collection are scarce, updates happen less frequently—and have correspondingly larger effects on measured GDP when they do.[70] For example, the price of phone service has fallen over much of the world in recent decades. In poor countries where the proportion of households with phones has risen sharply over the same period, this will have a much greater effect on the overall price level with newer weights than with old ones. So when weights are updated, it will produce the illusion of a sharp acceleration in real GDP growth. A natural solution would be to simply give two separate indexes for the periods using the different baskets. But the commitment to the idea of an underlying real quantity requires them to be spliced together, even at the cost of creating spurious changes in "real" growth.

For some years, there has been pressure in the US to adopt a "chain weighted" version of the headline CPI, with more frequent updating of the expenditure weights than the two-year cycle the BLS has used recently. The assumption, among both proponents and opponents of this change, is that it will lead to lower measured inflation. In the constant utility model, it would have to—the only reason purchases change under those assumptions is that people substitute lower-cost for higher-cost items. In reality, however, changes in consumption patterns happen for all kinds of reasons, and items with rapidly rising prices are as likely to see their expenditure share rise as items with rapidly falling prices. So more frequent weight updates can lead to higher measured inflation as easily as lower. Over the past year as we write this (July 2023), the BLS's experimental chain-weighted measure of inflation has risen significantly faster than the old measure with more stable weights.

The utility measure also assumes that every item purchased by consumers is in fact providing utility. But as we discussed in the first

section of this chapter, much of what is purchased by households could equally well be seen as inputs to production. This will change one's measure of price levels, across space as well as across time. For example, the economist Robert Gordon estimated that the bulk of the college premium in US wages goes away if you correct for the higher cost of living in areas where college graduates live.[71] This correction makes sense if college grads have to live in expensive urban areas in order to get their college wages. But if you instead assumed that the cost of living is higher in urban areas because of various nonmarket amenities, which college graduates are buying with their expensive housing, then Gordon's correction would be inappropriate. So again, while nominal values are real, in the sense that they observably exist, "real" values depend on assumptions about questions like "Why do college graduates move to big cities?" which go far beyond a straightforward question of measurement.

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The question of which commodities to include in the basket is equally consequential for measurement of "real" GDP.

Historically, food and clothing made up a much larger share of the consumption basket, and tuition and health care a much smaller share. The first official cost of living indexes were simply indexes of food prices, on the then-reasonable assumption that that was the price that mattered for working-class living standards. In the first survey-based consumption basket produced by the BLS (based on consumption patterns of 1917–1919) groceries (at 38 percent) and clothing (17 percent) made up a majority of the basket. As of 2023, these items make up 9 and 2.5 percent of the basket, respectively. At the same time, items like motor vehicles (8 percent of today's basket), medical care (also 8 percent), and education and communication services (6 percent) either were not present at all in the early baskets or made up a negligible part of them.

The effect of these differences on the overall price level are not unambiguous—while the measured prices of medical care have risen more rapidly than the overall price level in recent decades, the measured price of vehicles has (pandemic supply disruptions aside) risen more slowly. But certainly there is no reason to think that the questions, "How much would it cost today to buy the consumption basket of one hundred years ago?" and

“How much would it have cost to buy today’s consumption basket one hundred years ago?” (if it were even possible to do so) will have symmetrical answers. And both may be quite different from the change in the price level implied by the CPI.

The choice of basket can matter in more subtle ways as well. Consider housing. As discussed in the previous section, the housing services received by homeowners are included in GDP despite not involving any market transaction, by imputing to them a value equal to the average rental price of similar housing units. This “owners’ equivalent rent” makes up 8 percent of the GDP basket and—as of 2022—over 25 percent of the basket used for the CPI. But this is not the only way one might account for the price of housing. Prior to 1983, the BLS (which produces the CPI) instead directly measured the cost of housing to homeowners, with a measure that combined home prices, mortgage payments, property taxes and insurance, and maintenance costs. Unlike the BEA, which retroactively updates old data when methodologies change, the BLS continues to use the numbers produced at the time. So when you look up the inflation rate in 1980, it incorporates the price of housing measured in the old, out-of-pocket cost way, rather than the modern equivalent-rental-price way.

One could argue the merits of each of these approaches to measuring housing costs; probably which one is more appropriate depends on the question being asked. Most of the time, the choice doesn’t matter too much since they move more or less together. But as a 2022 paper points out, because the older measure included mortgage payments, it moved more sharply than the modern measure during periods of large interest rate movements.[72] In particular, the older measure showed much higher housing costs during the period of very high interest rates in the “Volcker shock” of the early 1980s, and a bigger fall as rates came down afterward. Because housing is such a big part of the CPI basket, this difference had a substantial effect on overall inflation—by the authors’ calculations, using the modern basket, inflation peaked at just over 10 percent, rather than the 15 percent calculated at the time (and still reported in official statistics).

These sorts of divergences are, obviously, important for macroeconomic history and policy. But for our purposes, the critical point is that choices about measurement with no obvious right answer—and about which different judgments have been made historically—have major impacts on

measured inflation and therefore real output. How much we see “real” output grow over some period depends critically on the choices we make about things like what “housing prices” actually mean.

Even limiting ourselves to the half dozen or so published indexes, the change in prices will vary considerably depending on which one we choose. Just among the most important published price indexes, we see the increase in the US price level over the past fifty years ranging from five times to nearly eight times. Statements that are offered as simple matters of fact, such as, “a dollar in 1960 ‘is equal to’ 13 cents in 2010” are fundamentally confused. They are not merely inexact or approximate. They are the economic equivalent of Noam Chomsky’s famous sentence, “Colorless green ideas sleep furiously,” which follows the rules of grammar but has no semantic content.

*

The conventional interpretation of the price level assumes that we can observe the same goods in each period, or at least tell if they are the same or not. But in many cases, we can’t—a commodity with the same name may differ in all sorts of ways. In the real world, commodities disappear, change in quality and scope (not just in price) and replace each other, and new commodities come into being. In some cases, newer goods and older goods trade side by side in the same market. When a new good costs more than an old one, is that a price increase? It might not be, if the difference reflects a genuine improvement—but then again, it might be. In other cases, one doesn’t even have prices to observe, either because the relevant goods don’t trade side by side or because there are no market prices in the first place.

The default approach to measuring inflation for goods that change frequently is to simply treat the new version as a substitute for the old one and compare their prices as if they were the same thing. But for a number of commodities, the statistical agencies try to separate out genuine price increases for quality improvements by treating a commodity as a package of underlying qualities that are what the consumer really desires.

For example, when measuring computer prices, the BLS separates out the underlying attributes of processor speed, memory, hard drive capacity, video capabilities, and monitor size, adjusting the price for any improvements in these areas. These types of adjustments are made for a

number of other goods, including cars and clothing, but the impact for computers is especially dramatic. In 2003, for example, you could buy Apple's entry-level laptop, the iBook G3, for $999. Two decades later, the price of Apple's MacBook Air started at the same: $999. Yet, according to the BLS, over that period the price of personal computers had fallen by over 80 percent.[73]

Why is this? It's because the 2023 model has far more memory, a far faster processor, and so on, than the 2003 model. The statistics are constructed on the idea that people are not buying a computer as such, but a package of features, so a new computer with twice as many of these features is the same as two older computers. Implicitly, it imagines a world where a full range of specifications are available and people are choosing the one that is best for them. For people who buy laptops to edit video, say, or do statistics with large datasets, these qualities may indeed straightforwardly translate into more value. But for someone who merely needs a computer for routine activity, the sticker price is presumably what matters. For these buyers, it's not clear that computers have gotten cheaper at all—yet for any calculation of real output or productivity based on these kinds of indexes, production of one computer in 2023 is treated as equivalent to production of six computers in 2003.

One funny implication of the aggressive quality adjustment for computers in the US is that it also raises estimated productivity for any job in the production or sale of computers. So while labor productivity in retail in recent years increases at close to the economy-wide average of 2 percent annually, productivity for retail workers in the electronics sector rises at a blistering rate of 10 percent—among the fastest of any occupation in the US.[74] Given the quality adjustments, this makes sense—as far as the statistics are concerned, selling one computer in 2023 adds the same value as selling six of them twenty years earlier. By this standard, today's Best Buy employees are indeed performing Stakhanovite labors. But if one looks at the concrete activity performed by the salespeople, it's not obviously different in the two years. Nor are their wages. Surely if productivity in computer stores had increased so much faster than in other retail sectors, pay would also have risen. In fact, pay for computer store employees has increased no faster than for other retail workers. The identity implied by the

price indexes—one computer in 2023 equals six computers in 2003—is clearly not a straightforward statement of material fact.

On the other side, there are cases where quality adjustments are *not* made, but arguably should be. When measuring health care prices, the statisticians simply look at the change in price of the same activity—one doctor's visit, one open-heart surgery. Yet here, even more than with computers, one could argue that what people are paying for is not the service itself but the outcome it delivers. What is being purchased, presumably, from the consumer's point of view, is not the surgery itself, but the additional years of life and health it delivers. Neither the BLS nor the BEA (nor any statistical agency outside the US, as far as we know) attempts to measure health care output in this way. This implies that any improvement (or worsening) in health care services is omitted from calculations of the price level or "real" GDP.

Like most of the issues discussed in this chapter, this problem is well known to the professional statisticians who construct the price indexes, and there have been many explorations of how a more meaningful measure of health care output might be constructed. A study by David Cutler and coauthors observed that the average cost of treatment for a heart attack rose by 4.2 percent annually between 1984 and 1998, which the official statistics treated as inflation.[75] But, they noted, the effectiveness of the treatment had also increased, which the statistics did not reflect. Measured in terms of additional years of life, the price increase would look much smaller. More recent studies have come to similar conclusions. None of this is to say that there is a "true" quality-adjusted health care price out there to be found. But there is something odd about the fact that statistics agencies go to great lengths to incorporate quality improvements in cars and computers, and not at all for hospitals or schools. Perhaps "Baumol's cost disease"—the widely held view that productivity improvements in services are systematically slower than in manufacturing—is, at least in part, really "Baumol's inconsistent quality adjustment disease."

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It would be a mistake, in our view, to take the lesson from this that quality adjustment needs to be applied more consistently. The whole project of measuring a consistent "real output" is a wrong turn. What really exists, on

the one hand, is a total amount of spending on various activities classed as production, plus imputed numbers for some shifting group of activities that don't have spending associated with them but that are supposed to more or less resemble the ones that do. These sums—nominal GDP—have been collected with more or less rigor by most governments since around World War II, give or take a decade. On the other hand there are indexes of the prices of various baskets of goods, corresponding more or less to the stuff whose spending is added up to make GDP, averaged together in various ways, which have been collected for a bit longer. You can divide the first number by the second one. You can divide any number by any number, if you want to. But the resulting value does not refer to anything in particular outside the computation itself.

Over short time frames, it doesn't matter so much. In general, alternative measurements of "real" output will give similar results when prices are reasonably stable and the baskets being compared are not too different, that is, when comparing output in the same area over a short period of time. As the time difference grows longer, and as we try to make comparisons between different countries—especially at widely different levels of development—the difference between different ways of calculating "real" output gets wider, to the point where the results reflect nothing but the preferences of the person making them.

Of Shoes and Skyscrapers

So far we have been talking about the problem with aggregating output and treating it as a physical quantity that grows over time. But attempts to think of different industries or products in "real" terms shows the problem even more acutely. If there is such a thing as "real" output, composed of different kinds of products or spending, then the real values of those components should add up to the total, just the way the weight of a bag of rocks must be equal to the sum of the weights of the individual rocks within it. But GDP and its components do not behave this way.

The problem is that money is the only technology that makes heterogeneous activities quantitatively comparable. As long as the price of this thing is double the price of that thing, we can say that one of these is equal to two of those. But in a different context, the relative prices might be

different, and then the quantitative relationship between them would be something else.

The problem of inflation adjustment is often presented as the need to correct for a measuring rod that changes length over time. But the problem is worse than that: Each type of good and activity has its own measuring rod, all of which are changing independently, with no way to say which one is the right one.

Consider two industries—shoes and haircuts. For a given area and time period, we can answer the question of how many shoes were produced and how many haircuts were given. We can divide total spending on shoes by the price of a pair of shoes to get a physical quantity—the number of shoes sold. We can similarly divide total spending on haircuts by the price of a haircut to get the number of haircuts. But the only way to combine shoes and haircuts into a single quantity is via their market price. And this varies across time and space. The number of shoes is a physical quantity and behaves like one. The number of adult shoes and the number of children's shoes must equal the total number of shoes; if the number of children's shoes rises while the number of adult shoes falls, the fraction of shoes that are children's shoes must go up. The same applies to haircuts. But it does *not* apply to the quantity of shoes and haircuts combined. If over a period of time the price of shoes falls relative to the price of haircuts (as it usually does) then it is perfectly possible for the real quantity of shoes to rise and the real quantity of haircuts to fall, while their shares of real GDP move in the opposite way.

This is not just a hypothetical example. We encounter exactly this problem every time we compare labor productivity across sectors.

In 1990, manufacturing workers in the US were 2.8 times as productive as workers in the rest of the private sector, in the precise and measurable sense that the value added (sales minus nonlabor inputs) of a manufacturing firm employing a certain number of workers was on average 2.8 times greater than that of a nonmanufacturing firm with the same number of workers.[76] This comparison does not require the use of any index number, construction of "real" values or assumptions about utility. It simply involves a set of dollar values (nonlabor input costs and sales) for each set of firms, and a physical measure (headcount or hours) of labor employed.

During the 1990s, productivity in manufacturing grew faster than in the rest of the business sector—3.8 percent annually, versus 2.2 percent.[77] This is a measurement in real terms—the same unit of manufacturing output (as the BEA measures it) took 3.8 percent less labor to produce each year, while the same unit of nonmanufacturing output took 2.2 percent less labor.

Given that manufacturing productivity grew more rapidly over the decade, you would expect the productivity gap between manufacturing and nonmanufacturing to have gotten wider. If output were a physical quantity, it would have to. But in fact, the productivity gap between manufacturing and nonmanufacturing workers *narrowed* over the decade.

The reason for this is that the relative price of manufactured goods fell relative to other business output. There is no way to correct for that. We can—with many caveats—compare real productivity growth within one industry to that in another. But it is impossible to compare the level of real productivity across industries. A comparison between industries can only be made in terms of money.

There is nothing unique about the case of manufacturing in the 1990s. Another example: In 2005, US labor productivity in the construction sector was 122 percent of the economy-wide average. In 2019, construction productivity was still relatively high—112 percent of the economy-wide average. Given the lack of change, you would expect construction productivity growth to have been close to that of the economy as a whole. But it turns out that during the intervening period annual productivity growth across the economy was 1.4 percent per year, while in construction it was *negative* 1.5 percent. If we imagine output as a material substance, it would be impossible for all of these facts to be the case. After falling for fourteen years, construction output per employee would have had to be well below the economy-wide average.

There is no way to reconcile these values if we think of productivity in physical terms. Using current dollars—the only tool we have for turning disparate products into a single quantity—construction workers were moderately more productive than average in both 2005 and 2019. Measured at 2019 prices, labor in construction in 2005 was twice as productive as the economy-wide average. Measured in 2005 prices, labor in construction in 2019 was barely half as productive as the economy-wide average. The

question of what the “real productivity” in construction was in the two years does not have an answer. The numbers don’t work that way.

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These seeming paradoxes are a vivid illustration of the fact that what we call “real” quantities are still monetary. The explanation of both paradoxes is that relative prices between sectors changed. In the 1990s—as in most periods—the price of manufactured goods fell relative to nonmanufactured goods and services. Over the more recent period, there was an increase in the price of structures relative to the overall price level. Both these changes—like the changes in relative prices that occur in any period—mean that the relative productivity of two sectors or industries in a later year, cannot be inferred from their relative productivity in an earlier year, and the changes in each one’s productivity in the intervening period.

Every economist knows this in the abstract. But they too often ignore it in practice and talk about GDP as if it were a quantity of stuff. In part, this is because the implications of the monetary nature of GDP are destructive for a large part of economic theory. Taking a money view of GDP means rejecting the idea that one can make quantitative comparisons between the level of output in widely separated periods or countries at different levels of development. Among other things, this makes the models of long-run growth that are so central to modern macroeconomics—both mainstream and heterodox—theories of an object that doesn’t exist.

Many of the questions we would like to answer can be answered, but not necessarily with the techniques of economics. “Real” productivity in construction compared with other sectors is, as we have seen, an inherently unanswerable question; output of different kinds of goods can only be compared using money prices. But that does not mean that the question of whether productivity in construction has improved, stagnated, or regressed is unanswerable. It just means we have to answer it in natural units. The writer Brian Potter has a fascinating discussion of how skyscraper building speed has varied over time and across cities, measuring in square feet per year.[78] The Empire State Building, for example, is about 2.2 million square feet, and was finished in just over a year.[79] More recent skyscrapers of that size typically take on the order of a decade to complete. By this measure, construction productivity has indeed declined.

As Potter is quick to acknowledge, this doesn't take into account changes in the nature of the buildings—early skyscrapers were primarily office buildings, while today's supertalls are mainly residential—as well as changes in building features and services and the regulatory standards they must meet. (It also doesn't take into account other outputs, like the survival of the workers—five people were killed during the construction of the Empire State Building, and quite a few more seriously injured.)[80] But the key thing is that square feet and construction time can be consistently measured. We would like an objective standard of the true value produced by an hour of labor. But no such measure is possible. Our choice is to accurately measure the things that we can measure. Or to make up numbers for things that we cannot.

What Can We Know?

Money is a measurement, a yardstick or mirror for the social world. A great many of our claims on society, most obviously our rights over the use of material objects, take the form of property claims with prices attached to them. A great many of our relationships with other people are structured through money payments. Your boss is your boss because they give you a check labeled "wages"; your landlord is your landlord because you give them a check labeled "rent." These money prices and payments can be added up, allowing us to compute totals of spending and income of various kinds.

It is natural to think that if money can be used as a measuring rod in this way, then there must be something that it is measuring. There must, in Ricardo's words, be "some object in nature to which the standard itself can be referred."[81] But this is not the case. The unavoidable fact, paradoxical as it may seem, is that money measures nothing but itself.

Real GDP, as we've argued in this chapter, does not refer to an object or quantity that exists in the world. Economic life consists of an endless variety of human activities and their products. We can combine these into a single quantity only via their prices at a given time and place. Within a single pay community, where prices are (more or less) uniform and where an equal price reflects an actual possibility of choice or exchange between two different objects, we can add up payments for a variety of objects and

come up with a definite quantity. In a different setting, with different prices, they would add up differently. There is not, and cannot be, a procedure to generate a single universal set of prices to allow for comparisons across different pay communities, or to extract a measure of the true value inherent in these objects independent of their price. Nor is there any universal rule for which payments to add—the definition of GDP has evolved over time under competing pressures of fiscal planning, macroeconomic management, and other policy goals, which often pull in different directions. When extended to historical questions—or in many poor countries today—the underlying data for even these limited goals are of poor quality, or simply unavailable.

Measures like GDP are sums of money payments. Within a given pay community, they may map more or less reliably onto nonmonetary measures of real activity. The choice of what payments to include in GDP (and what unmeasured or nonexistent flows to impute) is always fundamentally arbitrary—not in the sense of having no rational basis, but a choice that someone has to make, which depends on the purpose for which the resulting numbers are to be used. But the underlying relationship between payments and things has an independent existence. Within a pay community, a certain quantity of money can buy certain definite baskets of things. A local government facing budget cuts must choose between laying off so many librarians, or deferring so much street maintenance, or shuttering so many drug treatment centers. The equivalence between these alternatives is not a subjective judgment. The fact that each requires the same outlay of money is, within that community, an objective fact. Money measures what money can buy.

When we move to comparisons of output between different periods or countries, we are asking about the hypothetical choice that someone would make. What basket of goods here and now would someone trade for *that* basket of goods there and then? For such a comparison to give a definite value, we must assume a single representative consumer whose preferences are the same across all time and space. They must also consume goods in the same proportions at all levels of income. (This is the assumption of “homothetic” preferences.) If preferences vary—across time, over people, or based on income—then any price level comparison will have a different answer for each set of preferences.

So we already face intractable problems on the level of theory, where agents are choosing between commodities whose benefits are delivered directly to them when they are purchased. As we move toward a more realistic setting, the hypotheticals break down in a welter of subsidiary questions. When people produce estimates of Roman GDP in current dollars, one may reasonably ask questions about what exactly these mean. For example, how much would an ancient Roman value a TV set? It's hard to say. Is there a place to plug it in, in this scenario? Do other people have TVs? Is anyone making shows? Are they any good? We need not follow through all the absurdities that may arise to know that pay communities that are very different cannot be compared using such money devices. Such measurements are a form of anti-knowledge. They hide all the considerable knowledge that has been accumulated about material life in the ancient world and offer instead a set of invented statistics derived from a fantasy world in which all human life consists of a set of discrete objects whose relative values are everywhere the same.

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What, then, should we do? Should economists simply throw out the concept of real GDP? What should be put in its place? And what should the rest of us do to sort genuine knowledge of economic life from the anti-knowledge of the real?

The starting point is to think more carefully about exactly what we want to know, and what we *can* know. Not all questions have answers. In many contexts, including those for which GDP was originally devised, nominal quantities, measured in dollars or some other currency, may be the best we can do. In other cases, nominal figures will be misleading and some kind of scaling is necessary—economists' preference for real figures is a response to genuine problems of measurement and not (just) ideological hallucination. But price indexes are not the only possible scaling variable—in many cases, expressing values in terms of the average wage, as Keynes proposed, may be more transparent and meaningful than deflating by a price index. For comparisons over long time periods or between countries with very different economies, we should probably give up on monetary measurement, whether real or nominal, and focus on directly observable quantities with their own natural units.

To be sure, there are important cases where many of these physical measures move more or less in line with conventional estimates of real GDP. But this does not mean that the latter is capturing something real in the ontological sense; rather, it reflects the fact industrialization is a distinct historical process, in which many aspects of economic activity are transformed together. This means that many different indicators will tell similar stories. In Kuznets's original estimate of real GDP, he uses the production of key resources (like coal and steel) in their natural units as a proxy for overall activity.[82] These are among the short list of market outputs that rise rapidly in every episode of industrialization. These distinct and transformative episodes get lost when they are imagined as generic examples of "growth." The same goes for the questions of comparative well-being which motivate so much discussion of real GDP. There is no alternative to thinking carefully about what we imagine the good life to be, and what are the material preconditions for it.

In economics usage, the term "real," as we've stressed, is a heavily overloaded one. As the antonym of "nominal," it refers to a procedure of measurement, dividing by a price index. As the antonym of "monetary," it refers to a set of causal factors—those associated with human desires and capabilities, as opposed to those associated with changes in the availability of money. As the antonym of "financial," it refers to a set of institutions and activities—productive enterprises as opposed to banks and the like. And in its everyday ontological sense, it refers to something with a concrete, objective existence. The conflation of these different meanings is an outstanding example of the habit that Joan Robinson often criticized economists for—smuggling the theory into the terminology. So as a starting point, we should avoid using language in this confusing way. If we mean inflation adjusted, we should say inflation adjusted. Not "real."

As thoughtful economists like Wesley Mitchell and John Maynard Keynes insisted, while we can measure the prices of individual goods, or specified baskets, there is no such thing as "the price level" in the abstract. This chapter has given a long (and far from exhaustive) list of reasons why the numbers produced by conventional calculations of "real" magnitudes don't refer to anything real, in the everyday sense. But we understand that the demand to give them up cold turkey is not realistic. Fortunately, there are many cases where money values are what we are actually interested in.

Many of the questions we are interested in as economists involve comparisons of monetary quantities within the same exchange community. Among the more important of these are the those for which the concept of national income was originally developed, the feasibility of various proposals for public expenditure. Proposals for a crash program of decarbonization in the US often have suggested that it will require additional public spending on the order of 5 percent of GDP. As a political proposal, this is wildly ambitious. But as the historian Adam Tooze points out, it is vastly less than the World War II mobilization, to which it is often compared, in which military spending by 1944 exceeded *total* prewar GDP.[83] Even the most ambitious decarbonization proposals are similar in magnitude to the much smaller increase in US military spending during the Korean War.[84] This is a useful comparison—it suggests a level of spending that, while large enough to have noticeable macroeconomic effects, would not require the wholesale redirection of private activity of a total war mobilization. Reasonably stable—if far from precise—macroeconomic relationships even let us make a rough estimate of the effects this increase in the flow of public spending would have on observable aggregates like unemployment and the trade balance.

It's worth pausing for a moment to think about *why* GDP is useful in this setting. The public program here takes the form of *spending*—the government intends to exercise a claim on labor or other resources already for sale, by bidding them away from other claimants. This means that the impact on social activity will, in the first instance, take the form of redirecting existing flows of money to producers—the flows that are measured in GDP. It also means that the concrete objects that the government is claiming already have market prices, which the government will pay. The program is happening now, or in the near future; today's prices are the prices that the government will pay. The correspondence between money and things already exists in reality. It is not something we are trying to estimate or construct.

The specific procedures that guide the construction of GDP mostly make sense in this context. Newly produced commodities for sale may or may not be important for human welfare or utility. But they are what a program of public spending can redirect. It is reasonable, in this context, to count paid labor for childcare as part of GDP, and not the substantive equivalent

activities people perform with their own children. Both may contribute equally to human welfare. But the former labor is readily available to be hired for other purposes in a way that the latter is not. Here, again, we are not simply imagining social reality in terms of money but discussing the money flows that already organize it.

Similar comparisons of nominal quantities make sense for other purposes. A business considering entering a new market might reasonably estimate potential sales on the basis of GDP or some similar measure. Here again, the question is how much of existing payments for goods and services one can plausibly imagine diverting in a new direction. (In reality, presumably, most businesses would look at some more specific category of spending, but the idea is the same.) Such comparisons can even be made over widely separated settings, if the relevant data are available.

It's worth emphasizing here that prices are much easier to measure than quantities. To repurpose Irving Fisher's metaphor, to know the surface level of a lake, we only need to measure it in one place; to know the area or volume, we need to measure it everywhere. It is possible—though with many more caveats than are usually given—to say something meaningful about, say, typical wages for urban workers in fifteenth-century England, and compare them to the price of bread. It is *not* possible to say anything meaningful about aggregate income.

In all these cases, we are comparing values in the same currency from the same time and the same exchange community. Once that is no longer true, money quantities are less satisfactory and may be actively misleading. Among economists, who love to translate everything into "real" terms, this error is less common than the opposite one, but among the broader public it is ubiquitous. For example, a 2023 article in the *Financial Times* takes a recent decline in China's GDP as measured in dollars as a sign that "China's rise is reversing."[85] Not mentioned or, apparently, noticed by the author (Ruchir Sharma) is the fact that the Chinese currency depreciated by more than 8 percent against the dollar between 2022 and 2023. Of course the Chinese economy looks smaller when measured in dollars! But this reflects the speculative gyrations in foreign exchange markets, not any change in economic activity within China.

Even in cases like this, adjusting for inflation is not necessarily the best choice. One might, for example, simply use the average exchange rate over

a number of years to smooth out the effect of short-term swings. In other cases—both in scholarship and casual conversation—normalizing by the median or average wage gives a more meaningful and unambiguous answer to what one dollar or one rupee was worth in some earlier year than normalizing by a price index.

But in general, it is better, when money values are misleading, to measure something else instead. The same *Financial Times* piece notes that China's share of the world's working-age population has fallen from 24 percent to 19 percent.[86] One might wonder how much this demographic fact says about economic preeminence. But it at least has an unambiguous referent in the material world.

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GDP, again, is an aggregate of money payments, counted up in a particular way. Changes in the volume of these payments may be relevant for other substantive outcomes we care about. But that does not mean that they are a measure of them. If we are interested in other quantities, we must look for other ways to measure them.

In his Nobel lecture, Richard Stone made some interesting observations about the meaning and limitations of measures of output.[87] Speaking from long experience as a practitioner, he insisted that it is impossible to design a system of national accounts from first principles; their conventions evolve under the cross-cutting pressures of economic theory, the practicalities of data collection, and the policy purposes for which the accounts are to be used. Even insofar as "the economy" can be measured, he suggested, this is only one of several independent dimensions of analysis. Equally important, in his view, were demographics and the environment. His view that these outcomes are basically orthogonal to the measure of activity embodied in GDP is, it seems to us, very relevant to present debates.

Stone's warning has gone unheeded by those who want to treat GDP as an objective measure of material output. But his perspective is once again getting some traction among those who have to make use of economic statistics in policy and political settings. High-level proposals such as the UN Sustainable Development Goals or the proposals of the 2010 Sarkozy commission aim to expand the economist's toolbox beyond the traditional

measures used to rank countries by their economic performance.[88] These measures do not seek to convert the outcomes into an imagined monetary equivalent or to use money incomes as proxies, but instead look for outcomes that can be directly observed and measured in comparable ways across countries. These alternative measures are sometimes correlated with conventional measures of real GDP, but in other important cases they are not. And they lack the spurious precision of such estimates, or the temptation to extend them beyond the limits of observation.

What do we hope to achieve by measuring "real" GDP? There are several possible goals. One is to improve our estimates of the resources that can be potentially mobilized by spending money—the original aim of national accounting. A government budgeting for a war mobilization—or an all-out push toward decarbonization—must naturally take into account changes in the prices of the things it hopes to buy. Another is to assess macroeconomic conditions—is the economy operating below potential, and if so, how much stimulus is called for? When we are asking questions like these over some period of time, adjusting GDP for changes in the price level can be helpful—though more fine-grained measures are preferable and usually available.

A third possible aim is to compare economic welfare or well-being over time and across countries. Here money values are not informative. (It is not clear how helpful they are even *within* pay communities.)

What can we usefully say about well-being? Amartya Sen famously argued for the examination of "capabilities" as broader and deeper alternatives to metrics like GDP per capita. Poverty from this perspective is not just lack of money, but a lack of the substantive capacities required for a decent life. Development, conversely, is not just rising GDP per capita but the broadening of capabilities, at both the individual and collective levels. In many cases, these capabilities either are directly observable or can be assessed without reference to money. The fraction of people who are adequately nourished or in good health, or average life expectancy and mortality rates, can be directly measured and compared across time and space without being converted to money values. More complex capabilities, such as maintaining self-respect, community participation, or decent and meaningful work can in principle be measured through surveys. Even when we cannot measure them directly, we do know something about those features of social life that contribute to them. Sometimes we can measure

those. It seems safe to say, for example, that workers with formal representation through unions or similar bodies are likely to enjoy more self-determination at work than those who do not. And union coverage can be quantified and measured, even if workplace self-determination cannot be.

Focusing on specific metrics that we can both measure consistently across time and place and translate into concrete human experiences will tell us far more about material living standards than computations of "real" income, however sophisticated. That 5 out of every 1,000 people in the District of Columbia are homeless on a given day, or that India's child wasting rate is 20 percent, is a genuine if distressing addition to our knowledge about life in these places. Changes in metrics like these over time give us a legitimate basis to talk about material progress, or regress.

Conversely, it is a subtraction from knowledge to try to collapse these social facts into a poverty measure defined in monetary terms. While numbers on concrete facts like malnutrition and infant mortality are robust and broadly consistent over time, Indian estimates of poverty in 2023, based on money income, range from effectively zero to 22 percent (a difference of about 300 million people).

This example is worth a bit more discussion, since it illustrates a broader problem. There have been two distinct "poverty debates" in India over the last two decades. In the first set of exchanges, covered in a book by Angus Deaton and Valerie Kozel,[89] scholars debated the extent of poverty and the vastly different estimates that arise because of statistical issues such as discrepancies between surveys and national accounts about mean incomes, effects of questionnaire design, the impact of reporting periods, nonresponses in surveys, and so on. From 2011 to 2023, however, official statistics on consumption were not collected in the country (or more precisely, were collected but shelved for unknown reasons in 2017). As a result, the second poverty debate was around the extent of poverty reduction using different monetary poverty lines, each generated by particular assumptions of growth rates and distribution from other sources. The result in both was a stalemate, with little agreement on the appropriate money-metric poverty rate or how it had evolved. Naturally, the ranges are huge. At some level, this is unavoidable, since the choice of method involves many judgment calls. (In 2023, the government did release new

surveys that suggested substantial declines in poverty, but a debate remains about comparability with previous surveys.)

But this need not lead to defeatism. There are other poverty-related outcomes that we care about that do not require an income money-poverty measure to assess. Thus, for example, the Indian National Family and Health Survey showed that between 2016 and 2019 malnutrition rose in most states, while under-five mortality had fallen.[90] Both of these are concrete outcomes that we care about and that give a good, if complex picture on progress and living standards. The problem arises when these numbers are ignored and the money measures are preferred. For example, when challenged about these facts when extolling India's progress against poverty (as measured by PPP and money), a prominent economics blogger was able to blithely dismiss this as a matter of "nutrient balance"—they're not poor, they're just eating badly.[91]

Like most debates in economics, this one is very old. Very early in the measurement of living standards, the great French Italian mathematician Joseph Louis Lagrange (of the eponymous multipliers) argued that food statistics gave a better idea of a country's well-being and poverty than monetary measures of national income, and he focused more therefore on an exhaustive assessment of food intake and its measurement.[92] These concerns have been with us from the outset.

If we want to compare living standards in widely separated times or places, then, we will do better to focus on concrete indicators. Infant mortality, literacy, the fraction of people with access to clean water or electricity or phone service, are all meaningful and measurable indicators of living standards. A comparison of the health statistics, diet, living space, and working hours of a family of wage earners in turn-of-the-century New York with one of today will demonstrate the concrete improvements in material well-being between then and now more clearly and convincingly than the increase in "real" incomes will.

Quantitative comparison between rich countries on this basis is harder—everybody already has electricity and potable water. This doesn't mean we need some other number. It means the question is not meaningful. The question, "Does a middle-class family have a higher standard of living in New York, in Paris, or in Seoul?" is one on which one can certainly have an

opinion and support it with evidence, but it is not answerable in quantitative terms.

In some cases, the income statistics say one thing and the material measures say something quite different. One may claim, as Angus Maddison does, that real per capita GDP in India doubled under British rule.[93] Such a number, reproduced in tables, gives no hint of the pile of imputations and assumptions it rests on. Meanwhile, it remains the case that life expectancy, as measured by consistent censuses, remained essentially constant under the century-plus of British rule, never rising above twenty-seven between 1800 and 1940. Since independence, it has risen to sixty-seven.[94] One can debate, of course, how much of this change is due to the end of colonial rule, and how much due to secular improvements in modern medicine. The point is that, unlike the imaginary GDP guesstimates, it offers an unambiguous quantitative measure of people's material living standards.

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One virtue in seeing that money prices don't refer to anything except themselves is that it frees us to think about what one *can* measure. Money does have a sociological reality and does shape and constrain life, but it is not because it is faithfully reflecting some biophysical quantity. Realizing this is not an act of nihilism, but an act of clarification. Freeing ourselves from the anti-knowledge of made-up aggregates that are not aggregated from anything, allows us to see more clearly both those quantities that can be consistently measured over time, and the way that money values do not simply reflect values that already exist, but actively shape our collective activity.

Interestingly, one of the clearest statements of this point came from the Norwegian economist Trygve Haavelmo, who in the 1940s was one of the main developers of the statistical techniques of econometrics. His warnings seem, to us, as timely and relevant as when he gave them some eighty years ago.

Economic theories, Haavelmo stressed, "are necessary tools in our attempts to understand and explain events in real life . . . not hidden truths to be discovered."[95] The flip side of this—and the critical point for our

purposes—is that economic claims are meaningful only insofar as they can be connected to concrete observable facts. A system of equations, insists Haavelmo, does not become a description of economic life "just by calling *x* 'consumption,' *y* 'price,' etc." An economic model has content only insofar as "we have in mind some actual experiment . . . to measure those quantities in real economic life that we think might obey the laws imposed on their theoretical namesakes."[96] It makes no sense to ask what the meaning of a variable within a model is; its meaning comes only from some concrete activity we can carry out, outside the model, whose outcomes we can observe and record in an agreed-upon way.

In the case of variables like output or income, the actual experiments are the national accounts. These concepts mean something only in the context of a particular procedure for adding up specified money flows, as codified in the US National Income and Product Accounts or the international system of national accounts. In a very real sense, macroeconomics is the study of why a government statistician entered this value into a form, rather than a different one.

Social science—including economics—has done a great deal to make our collective activity legible. The patterns of money payments generated by the pursuit of profit have a definite structure, which is a legitimate subject of scientific inquiry. The challenge is to summarize our knowledge of these payments with suitable abstractions, without reducing nonmonetary structures and activities to a phantom image of the monetary world.

Money, say the textbooks, is a veil, suggesting a gauze or film obscuring the features of a solid underlying object whose contours it follows. On the contrary, we insist, money has its own solid existence; the lumps and bumps we perceive in it have their own reality and are not merely a record of something lying beneath it. Money is a powerful social technology, one that breaks up deep-rooted human relationships and facilitates the creation of new ones. Money is a measure, but not one that shows an image of what already exists. If it is a mirror, it is an enchanted mirror out of a fairy tale, that transforms the objects reflected in it.

But there is another sense in which money is indeed a veil. It is a veil that we put on ourselves. Money quantities are a veil not because they obscure the underlying real quantities, but because they tempt us to imagine such real quantities. We observe around us a vast web of money prices and

payments and claims. It is natural to suppose that the material and social reality that lies behind them has the same structure—that each quantity of money corresponds to a quantity of some material thing. Much of our criticism in this chapter is directed at economics, but this is in no way a problem only for economists. It is a way of thinking that is second nature to everyone who lives in this world.

We assume that if something has a price in the market, it must already have a value in itself. When we talk about someone's income, we refer to how much they "make" or "earn," implicitly assuming that the money received from a productive enterprise must be matched by some quantifiable contribution to production flowing the other way. We imagine the material and social world on the model of property rights—discrete, transferable, each with its price tag. From the scrim of numbers money projects onto our field of vision, we infer a world composed of equivalent quantities. Our efforts to "master the happenings of everyday life," in Haavelmo's words, are constantly obstructed by this monetary veil.[97] If we close our eyes to what is tangible and knowable in the world in favor of a hallucinatory grid of money quantities, we should not be surprised that we so often run into walls.

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Part 5

Money Against Humanity

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7

The Ends of Money

In this final chapter, we try to think about the long-run trajectory of the rule of money over society, and how to imagine it ending. Here, we can do no more than gesture toward some routes forward. But perhaps that's enough. Projects of social transformation are almost always better thought of in terms of a direction of travel than of a final destination.

The Double Movement

Capital is a way of organizing collective activity that has been built atop money and has extended the reach of its logic to vast new domains of human life. Its development over the past centuries has been, perhaps, the strangest and most disconcerting process that has yet befallen an aggressive ape species out of Africa. Our historical moment is one in its wake, in which it has torn asunder so many previously stable life worlds.

Our very notion of time, as E. P. Thompson describes in a classic essay, has been fundamentally altered by the working habits required by capital.[1] The quantification of our lives as labor power—their enforced equivalence with units of money—is now something almost all of us carry everywhere with us on our wrists, or on screens in our pockets.

Or consider the history of cotton, as described by Sven Beckert.[2] Once it became a critical node in the path from money to more money, this humble plant became the vehicle for violent annexation of territory, destruction of older ways of living, enslavement of people, and the transformation of work in fields and factories. As Beckert so vividly describes, the equivalence of cotton with money required, and organized, the wholesale redirection of human activity at the wrong end of a whip or a gun. It is not for nothing that cotton took on such a central focus in the ideas of Gandhi. The extraction of the tangible thing—the plant and the spinning wheel—from the circuit of

money became a symbol of self-reliance and a peaceful escape from the depredations of capital.

Capital's displacement of other ways of organizing and understanding our lives is a central theme of postcolonial fiction. Think of Chinua Achebe's trilogy on the Igbo people in Nigeria,[3] or of the Syrian Saudi author Abdelrahman Munif's description of the birth of petro-capitalism of the early twentieth century and the despotic monarchies that grew symbiotically with it, in his magnificent *Cities of Salt*.[4]

It is not hard, today, to imagine this process continuing without limit, rendering all human values convertible into money and erasing all other ways of organizing our lives.

Branko Milanovic, perhaps today's preeminent scholar of global inequality, offers a sharp, bleak, and uncompromising version of this vision in his 2019 book, *Capitalism, Alone*. In the final chapter, he addresses the tendency of capitalism to commodify all kinds of relationships. He sees this as producing a change not just in certain social arrangements but in our inmost selves, to the point where human beings will really be the rational calculating automatons of neoclassical theory. The world is approaching a state in which

> capitalism [has] transformed human nature such that everyone has become an excellent calculator of pain and pleasure, gain and loss—so much so that even if capitalist factory production were to disappear today we would still be selling each other services for money; eventually we shall become companies ourselves. Imagine an economy (similar externally to a very primitive one) where all production was conducted at home or within the extended family. This would seem to be a perfect model of an autarkic nonmarket economy. But if we had such an economy today, it would be fully capitalistic because we would be selling all these goods and services to each other: a neighbor will not keep an eye on your children for free, no one will share food with you without payment, you will make your spouse pay for sex, and so forth.[5]

Milanovic suggests that if the logic of monetization and commoditization is expanding without limit; every other way of organizing human activity will eventually have to succumb.

The British journalist Paul Mason similarly imagines a future where capitalism can "turn much of what we currently do for free, socially, into paid work. . . . mums with their toddlers in the park could charge each other a penny each time they took turns to push the swings." In this future world, which he offers as a thought experiment rather than a prediction, we would "treat people kissing each other for free the way they treated poachers in the nineteenth century."[6]

These dystopian visions capture an important aspect of the world that we live in. There is a reason Marx begins *Capital* with a discussion of commodities, odd as it sometimes seems to new readers. For capitalism's greatest critic, commodification was (along with capital accumulation) the system's defining feature. For Milanovic, capitalism's ultimate victory is one in which this feature totally dominates. It is certainly not hard to find new areas of human life being treated as commodities, or reorganized in the pursuit of profit. It might seem, at first glance, reasonable to imagine a logical endpoint to this process, which might not be far off.

A little more thought, though, suggests that such an endpoint is not only far off, but unreachable even in principle. When people talk about the "commodification of everything" they can do so only because they have so taken for granted the institutions that allow commodities to exist in the first place; they treat them as just part of the nature of the world. When the logic of markets is extended to the institutions that sustain them, markets themselves break down.

Money, remember, is not a natural object in the world. It is a vast system of social recordkeeping, which only exists insofar as the recordkeepers faithfully execute it. One can imagine, in principle, a world where your neighbors demand payment before watching your kids. But what if, when you went to make the payment, the relevant bank employees first held an auction to see if anyone would offer them a better deal to transfer your deposit to someone else. What if the court responsible for enforcing the contract openly offered to deliver a judgment for whoever paid more? Even if one bribed or cajoled the necessary authorities, an entry in the ledger of such a bank would not be accepted as payment, since it would no longer

give a reliable claim on the social product. In a world where *everything* was for sale, nothing would be. Neither money nor property rights would exist.

Still, isn't there something to the vision as a description of a trend?

It is hard to deny that over the past generation the domain of life that is organized by the logic of the commodity has expanded, at the expense of other systems of organizing human activity. Perhaps not everything is for sale, but surely more is for sale now than was twenty or fifty years ago? Surely the election of Donald Trump, the crass commercialization of political office, and the concentrated political power held by billionaire oligarchs suggest that the rule of money is ascendant, now, more than ever?

Here too, though, some skepticism is called for. Money and markets are less dominant in the actual organization of collective activity than in our understanding of it—not least in the minds of their critics. It is often easier to see commodification than its reverse, even though it also surrounds us. Look, for example, at the continued dominance of public provision of education and health in many societies. Look at the prevalence of free and open-source software (many big servers run Linux), or for that matter, at science as a whole. Even in the United States, supposedly the world's leading market society, universities—one of the country's most successful industries—are basically worker collectives engaged in the production of decommodified knowledge, with minimal direct role for profit. (We often hear about the privatization of the university. Yet over the past decade, the share of US college students enrolled at public institutions actually rose slightly, while the share at for-profit institutions fell by half.) The internet has opened vast new domains of non-commodified cultural production, which the best efforts of the tech companies have not yet reduced into products for sale. That Wikipedia—nonprofit, decentralized, volunteer-produced—would become the preferred source of all kinds of information would have seemed like an extraordinary development before it happened, but we now take it for granted. Social media sites are, unignorably, run as profit-seeking private businesses, but the content they sell is produced by their users for entirely other motives. While all of these are under severe attack, it is not because of their failure, but because of their success.

It is difficult—if not impossible—to quantitatively compare the extension of the domain of life where money rules from that of the domains organized on other principles. But a meaningful picture must include both sides. A

central prop of the rule of money is the difficulty we have seeing how much of our world has already escaped it.

It is far from clear that the domain of market logic is extending, or if it is decreasing. Certainly there are still public services being privatized, and commons—physical and otherwise—being enclosed. But in many other cases, the zone of the private market is diminishing. The challenge of climate is forcing governments, often against their wishes, to take a more active role in the direction of private investment. The COVID-19 pandemic at once demonstrated the brittleness of the global supply chains underlying private manufacturing, and the potential for public action at a speed and on a scale that would not previously have been considered. However one classifies the Chinese economy, its unprecedented success in industrialization while violating the central tenets of the Washington Consensus has severely, perhaps fatally, damaged the global consensus in favor of a certain ideal of the "market economy."

When we step back and think about capitalist production, we can see that market logic is far from completely established even on its home ground. It is not just that successful developers like China depart from the ideal; the idea of a market economy is itself an illusion created by seeing the world through the veil of money. And yet, paradoxically, removing this veil also brings into focus the progressive, creative, and transformative role of money—and credit, and capital—in the development of our collective abilities.

Karl Polanyi famously described a "double movement" in which the logic of markets was extended to new areas of life but then, when this proved destructive of the institutions by which society reproduced itself, forced back into a more circumscribed role.[7] This idea captures an important insight—the extension of money and markets is not a one-way process. But where Polanyi speaks of a pendulum, which oscillates back and forth around a fixed center point, we would imagine a spiral—a cyclical movement that does not return to where it started.

Money as Catalyst

At various points in this book, we have discussed Keynes's vision of the economy as a system of monetary production—a collective process of

open-ended transformation of the world organized through money payments and promises. This vision, as opposed to the real-exchange vision that continues to dominate thinking about economic life, reveals the pervasive departures from commodity logic in the economies in which we actually live.

The most obvious distinction between the two visions is whether money can be regarded as neutral—and, in particular, whether the interest rate can be thought of in "real," or nonmonetary, terms as the price of goods today versus goods tomorrow, or whether we must think of it as, in some sense, the price of money.

But there is a deeper distinction between these two visions, which comes from the production side of the dyad. On the one hand, we may think of economic life fundamentally in terms of objects: material things that can be owned and exchanged, which exist prior to their entry into economic life, and which have a value that reflects the difficulty of acquiring them and their capacity to meet human needs. This value merely happens to be represented in terms of money. On the other hand, we may think of economic life fundamentally in terms of collective human activity, as the domain of production and reproduction in which the pursuit of money plays a central organizing role.

Ignoring or downplaying money, as economic theory has historically done, requires imagining the "real" world is money-like. It is only in this way that we can imagine a world where markets play a central or exclusive coordinating function. Conversely, recognizing money as a distinct social institution requires a reconception of the social world outside of money. On the one side, we must ask how monetary claims and values evolve independently of the real activity of production, as we did in the chapters on debt and capital. And on the other side, we must pay attention to the ways that money builds on, reinforces, or undermines other forms of authority and coordination.

Recognizing the distinct logics of money and production helps us see all the ways in which existing forms of production are *not* organized through money and markets. We are all taught to treat money as a transparent window into the material and social world. Money, to be sure, does reveal objective realities—the cost of this, my obligation to pay that, are genuine social facts. And these facts in turn often have, at least in a given exchange

community, a correspondence to observable features of nonmonetary reality. Two bottles really do contain twice as much ketchup as one does, and will, in most cases, cost twice as much. But the image we see through this window is superimposed on a reflection of money itself. A world seen through money consists of discrete, quantifiable objects, each with an owner, with no other relationships except arm's-length market exchanges that express the equivalence of the object with money.

The organization of social existence through money means that many of our relationships do indeed take this form, or some approximation of it. But not all of them, and none of them completely. The many ways in which the social and material worlds are not money-like are hidden from our view when we see them through the distorting lens of money. The contribution of the monetary-production view, and of its elaboration in this book, is, we hope, both to help us see all the ways in which money rules our lives *and* all the ways in which it does not.

*

From the real-exchange view, in which commodities are objects already existing in the world, the central economic problem is that of allocation. The possibilities for production are out there; the challenge is simply to choose which of these will best satisfy human needs, given the trade-offs between them. This is the problem that markets—with money in a secondary supporting role—are supposed to solve.

From the monetary-production view, neither the routine operation of capitalist economies nor the choices facing us in response to challenges like climate change should be seen in terms of scarcity and allocation. Thinking in terms of monetary production does not just mean adding money as another input. It means reconceiving the production process, as something quite different from the exchange of existing commodities. The fundamental problem is now coordination—capacity for organized cooperation.

To say that production is an open-ended collective activity of transforming the world means that its possibilities are not knowable in advance. We don't know how much labor and machinery and raw materials it will take to produce something new—or something old on an increased

scale—until we actually do it. Nor do we know how much labor is potentially available until there's demand for it.

It is usual—and not only among economists—to think of capital's self-expansion as subject to some hard limits, as following some fixed, long-run trajectory from which it can only depart temporarily. Such a vision is required to make the growth process analytically tractable; it is reassuring in broader ways as well. This is most often imagined as a quantity of labor and other real resources that is given from outside the system and increases at a fixed rate. This is the vision of the Solow growth model that is the core of contemporary macroeconomics, as discussed in earlier chapters. Others imagine hard limits as a fixed amount of demand. In this story, trying to exceed these limits simply results in overproduction and excess capacity, as competing producers fight over shares of a given market. Either way, the possibilities for production exist before production itself is actually carried out.[8]

But this is not the case in the real world of industrial production. Again and again over the past two hundred years, we have seen production break through what had up until then seemed the barriers of the possible. Very few technological breakthroughs were predicted in advance; in real-world production, there is ubiquitous learning by doing, where the possibilities and techniques of production can only be known by actually carrying it out. And on the other side, falling prices have repeatedly opened up vast new markets whose extent could not have been guessed in advance.

Capitalist production certainly encounters barriers—a demand shortfall here, labor scarcity there, a lack of financing over there. From the real-exchange perspective, these represent objective constraints that must be taken into account in optimization. But from the monetary-production view, they are only relative constraints, signs that one part of the system has advanced too quickly ahead of the others. Here is Jules Michelet's beautiful contemporary description of the 1842 commercial crisis in France: "The cotton mills were at the last gasp, choking to death. The warehouses were stuffed, and there were no sales. The terrified manufacturer dared neither work nor stop working with those devouring machines. Yet usury is not laid off, so he worked half-time, and the glut grew worse. Prices fell, but in vain; they went on falling until cotton cloth stood at six sous."[9] We should never forget about the misery and chaos of crises like this. But we should

also not forget how this story ends. It is not “and then eventually enough mills were shut down and growth returned to the same long-run path as before.”

Here is how the Michelet passage continues:

> Then something completely unexpected happened. The words six sous aroused the people. Millions of purchasers—poor people who had never bought anything—began to stir. . . . The warehouses were emptied in a moment. The machines began to work furiously again, and chimneys began to smoke. That was a revolution in France, little noted but a great revolution nonetheless. It was a revolution in cleanliness and the embellishments of the homes of the poor; underwear, bedding, table linen, and window curtains were now being used by whole classes who had not used them since the beginning of the world.[10]

An openness to the possibility of this sort of transformational change is what’s missing from a vision of the economy centered on scarcity and allocation. This is not a system in homeostasis that, if disturbed, returns to its old position. It is a system lurching from one unstable equilibrium to another.

In a system like this, the constraint, as we’ve stressed, is coordination. Modern industrial economies involve a vast division of labor. Growth therefore requires a great number of decisions to be taken in sync, across a wide range of sectors and enterprises. A business expanding production has to be confident that the market for its products is also growing, as well as the supply of the inputs it uses, the financing it depends on, and the labor it exploits. An interruption in any of these will halt the whole process. When growth is steady and incremental, this can be mostly taken for granted, but not in the case of more rapid or qualitative change, as in industrialization.

In this context, the fundamental role of money is not to facilitate exchange. It is to break people loose from their existing relationships and commitments, to make them and whatever resources they have claim to available for something new. Money, and credit, and capital, are transformative. Their effects on older communities and forms of cooperation can be profoundly destructive. Certainly they are often

experienced that way. But they make possible the development of new human powers that could not have been predicted, that have not been seen since the beginning of the world.

*

Markets are often thought of as a system of allocation. But this isn't right, or at least it's incomplete. The actual development of capitalism involves the progressive substitution of conscious planning for allocation through markets. The firm is, internally, a planned economy. It acquires its inputs and sells its outputs in markets, yes, but on terms guided by conscious choices, not solely in passive response to price signals. We must take the firm seriously as an ongoing community, embodying multiple social logics. Firms combine the structured cooperation needed for production; a nexus of payments and incomes; an internal hierarchy of command and obedience; and a polis or imagined community for all those employed by or otherwise associated with it. Wealth owners (with the important exception of landlords) do not normally own capital goods as such, but rather financial claims against these social organisms.

In the real world of pervasive increasing returns and market power, it is not the case that markets dictate even in the long run. Finance, as we have stressed, exists precisely in order to allow production to depart from market signals. Indeed, it not only permits this but requires it. Any business that operates for any length of time at a loss—which almost all do, especially in their early years—is doing so in defiance of market signals. Conversely, many firms whose operations are profitable still shut down, or downsize, because of the need to make payments to financial claimants.

As one of us has observed elsewhere, "there is a basic contradiction between the principles of competition and finance. Competition is supposed to be a form of natural selection: Firms that make profits reinvest them and thus grow, while firms that suffer losses can't invest and must shrink and eventually disappear. This is supposed to be a great advantage of markets over planning. But the whole point of finance is to break this link between profits yesterday and investment today. The surplus paid out as dividends and interest is available for investment anywhere in the economy, not just where it was generated."[11] Advocates for capitalism sometimes describe it as a sort of Darwinian competition, in which successful firms grow and

unsuccessful ones perish. The entire purpose of finance is to prevent actual capitalism from behaving this way—to, in effect, replace an organic link between surplus and accumulation in a particular firm or industry with a centralized allocation of the surplus via the financial system.

Investment always involves planning. By separating production decisions from sales, it creates an interval over which conscious planning must operate; the longer the separation, the more capital-intensive the business, the more market signals become attenuated. All this planning is not even "ultimately" guided by market criteria. Even leaving aside the large swathes of finance that are ultimately accountable to nonmarket actors—pension funds, endowments, the Saudi royal family—the relative profitability of different investments is dependent on prevailing interest rates, which are set, or at least influenced, by central banks.

Finance aside, it is hard to imagine how a system of production dependent on long-lived capital goods (and long-lived business enterprises, and scientific knowledge) could be organized on the basis of the pursuit of private profit.

The most obvious reason for this is that the profits from these kinds of activities depend on developments well off in the future that cannot be known with any confidence. As our teacher Jim Crotty emphasized, this means that there is no coherent way to regard the investment decisions as profit-maximizing; the eventual profits of a project have no objective existence at the time that it is undertaken. Expected profits are fundamentally subjective, a description, at best, of the state of mind of the decision-maker at the time. The level of investment spending therefore is a function of the state of mind—the "confidence"—of those who make the investment decisions.

Second, investment decisions are irreversible—capital goods are specialized and embedded in particular production processes and enterprises. Money is a claim on the social product in general, a way to maintain the option to acquire some unspecified thing at a later date and, even more importantly, to meet future obligations, to satisfy what Minsky called the survival constraint.[12] Wealth frozen into capital goods and the firms surrounding them is the opposite of this.

Meanwhile, uncertainty about the future amplifies and exacerbates the problems of coordination. The success of any long-lived investment project

depends on the choices of many others carrying out similar decisions, with no assurance that these separate choices will be consistent with each other. Normal market transactions, which involve trading off a bit more of this for a little less of that, can be undertaken on the assumption that everyone else's behavior will remain as it is. But the larger-scale and longer-lived an investment project, the less credible this assumption is.

The reason that many potentially valuable activities are not undertaken, then, is not that they would require real resources that people would prefer to use otherwise. It is that people don't feel they can risk the irreversible commitment those activities would entail. Many long-lived projects that would easily pay for themselves in both private and social terms are not carried out, because an insufficient capacity for trustworthy promises means that large-scale cooperation appears too risky to those in control of the required resources, who prefer to keep their options open.

The problem, in short, is that wealth owners prefer to exercise their claim on the social product directly through money, rather than indirectly via concrete productive processes. The term "monetary production" describes a system of production organized through money and in pursuit of money. But it also points to an irreconcilable conflict between production and money.

*

We have said that money is essential to solving the problems of large-scale coordination mechanisms, a tool that has allowed for vast transformations of production and material life. And we have said that production in the real world is not and cannot be organized through money and markets. Can both be true?

One way to reconcile this contradiction is to see these as two distinct moments in a single process, in which social ties are first broken up and then reconstituted on a new basis. Money, we suggest, can be thought of as a social solvent. It breaks up earlier forms of coordination, erases any connection between people. It allows people to coordinate on one specific part of a production process without any preexisting relationship with each other, or any expectations of each other going forward.

We began this chapter by pointing to the disruptive force of money on all kinds of social ties. Perhaps the most famous description of this relationship-dissolving quality of money is that of Marx and Engels in *The Communist Manifesto*. The extension of markets and money into new domains of social life, they write, has "remorselessly torn asunder the motley feudal ties that bound people to their 'natural superiors,' and has left remaining no other nexus between two people than naked self-interest, than callous 'cash payment.'"[13]

But what they do not add is that social ties don't stay torn asunder forever. The older social relations that organized production may be replaced by the cash nexus, but that is not the last step, even under capitalism. It is, or can be, a temporary step toward the re-embedding of productive activity in new social relationships. We described money a moment ago as a social solvent. But one could also call it a social catalyst. Breaking up the social ties that formerly organized productive activity allows them to be reorganized in new and more complex forms.

Money is a tool that allows promises between strangers. But people who work together do not remain strangers. Early corporations were sometimes organized internally as markets, with "inside contractors" negotiating with each other. But reliance on the callous cash payment seldom lasted for long. Large-scale production today depends on coordination through formal authority. Property rights become a kind of badge or regalia of the person who has coordination rights, rather than the organizing principle in its own right.

Money and credit are critical for reallocating resources and activity, when big changes are needed. But big changes are inherently a transition from one state to another. Money is necessary to establish new production communities but not to maintain them once they exist. Money as a social solvent frees up the raw material—organized human activity—from which larger structures, more extensive divisions of labor, are built. But once larger-scale coordination is established, the continued presence of this social solvent eating away at it becomes destructive.

What, then, do markets do? Their essential content, it seems to us, is to separate contributions to social production from any larger social context. Market transactions are one and done. Instead of us cooperating in some activity in a way that requires ongoing relationships of trust, hierarchy,

reasoned agreement, or established habit, markets consist (tendentially at least) of a one-off exchange of a concrete object or action for a money payment, the latter exhausting the obligations entailed by the former. They allow decisions about productive activity to be made independent of who will carry them out, or how the results of them will be used.

To buy something in the market does *not* imply that there has been some automatic calculation of social costs and alternative uses. It *does* imply that we can imagine a claim to the thing being reassigned to some other person or use, that it is cleanly separable from the person and purpose it is currently attached to. It implies that someone other than you might just as easily claim this object or exercise this authority. There's nothing special about you.

Another way to look at markets is as a kind of pooling of coercive authority. At one point, we might say, the father exercised a certain specific authority over his children, the landlord a certain specific authority over his tenants, and so on. The development of markets merges these hierarchies: the daughter or peasant now must obey whoever will pay them, while the masters give orders to whomever they hire. "Money is institutionalized social power," as political theorist Anush Kapadia puts it; it "encapsulates the power of productive collective action in a flexible, tradable instrument."[14]

We earlier quoted Schumpeter's suggestion that banks are capitalism's equivalent of the Soviet planning body Gosplan. But they are stronger in a certain way than any real central planner because they have the authority to redistribute anything. A Soviet planner might assign a plant this many tons of some raw material, that much electricity, use of those parts of the transportation network. Money as the universal equivalent is a token granting the holder use of whatever they need. A loan then is a ticket to the entrepreneur saying, you have the authority to take whatever labor and other resources your project requires.

In this sense, markets are not an alternative to planning, they are a tool for planning. Money is the substrate within which planning takes place.

Money, we suggested, can be thought of as a social catalyst. Capital then is the reaction that is being catalyzed. We might, in this metaphor, see the famous circuit of capital linking money (M), to commodities (C), to production (P) to new commodities (C') and more money (M') as a kind of

chemical formula. The fact that *M′* is greater than *M* is like the release of energy that allows a chemical reaction to be self-sustaining.

Think of commodification as the front edge of a forest fire. Initially, there is a great deal of dry tinder—a world of little disconnected processes of decommodified production within small social units (*C-C′*) and market exchange aimed at satisfying concrete needs rather than expansion of money (*C-M-C′*). Then capital's reaction *M-C-M′* arrives and, given appropriate social conditions, breaks up these social molecules and incorporates their components into itself. The incorporation of freestanding *C-C′* circuits into an *M-C-P-C′-M′* circuit changes them in two ways. First, the initial input and final output now are acquired with money at the start of the process and converted back into money at the end of it. Second, the direct connection between input and output has been broken, and wage labor has been inserted between them. This social transformation is well known to anyone who has read Marx or works inspired by him.

But there is a further step, which is less discussed. This reaction does not just convert a simple *C-C′* has into a simple *M-C-P-C′-M′* and then stops. The spread of the reaction creates more and more structure between the money ends. Other little *C-C′* and *C-M-C′* circuits are incorporated into an increasingly long chain between the initial outlay of money and the realization of money at the end. (We can think historically of the way different stages of cloth production were brought into the factories not all at once, but in stages—first weavers, later spinners, and so on.) These little circuits could never merge on their own; their binding energy, to stick with the chemical metaphor, is too great. But once they have been combined, the new configuration is more stable. (And, returning to the historical case, more physically productive—the combined spinners and weavers produce far more cloth with the same labor than they did as independent artisans.) As this continues, the chains of directly linked commodities and productive processes between the money moments get longer and longer; the money moment itself takes up a smaller and smaller fraction of the cycle. More and more activity takes place in the interior of the new larger social molecules being formed.

This is perhaps the key reason that Marx thought of capital as progressive. (It is also because many of the simpler social molecules consumed in the fire of capital were hierarchical and repressive in their own

ways.) The violent breaking up of old forms of socially embedded production is a necessary step toward the recombination of their elements in more complex ways—to the development of a more complex and powerful division of labor.

But what if the gains from breaking economic life down to its constituent parts and recombining them have an endpoint—either because the technical improvements are exhausted, or because the social needs served by production have all been satisfied? While money is needed to produce a new, more complex structure out of the scattered isolated production processes, once the structure exists money is excluded from it. If you think markets are needed to reveal information, then once that information is revealed we all have it. At that point we can use it to organize how we like without further need for markets. The end of the money form is simply the completion of its catalytic function.

It is as if the leading edge of the chain reaction of capital is burning through the disorganized fuel and leaving behind a solid crystal. The money moment may eventually just flicker out on its own, once all the energy-releasing reactions have taken place. Or if it keeps guttering on, it won't be a danger to anyone.

Our suggestion, in other words, is that the end of the rule of money will not come from processes internal to capital—a fall in the rate of profit, a lack of outlets for investment. Rather, it will come from the progressive separation of those processes from the concrete social reality that they still structure in so many ways. Perhaps "capital" will always be making a "profit" somewhere in money world, just as someone somewhere is still the heir to the throne of France. It just won't matter to the rest of us. To paraphrase Keynes, there is no harm in people tyrannizing over their bank balances if they can't tyrannize over the rest of us.

In Marx's view, certainly, the transition from industrial capitalism was likely to be a smoother, more organic process than the violent dispossessions it originated with. "The transformation of scattered private property . . . into capitalist private property is, naturally, a process, incomparably more protracted, violent, and difficult, than the transformation of capitalistic private property, already practically resting on socialised production, into socialised property."[15] At some point people look out the window and say, "look, it's socialism."

In reality it won’t be so simple. But this is because of the political attachment of elites to the vision of a world organized through money, and the legitimacy they gain as “property owners.” And perhaps even more, because of the hold this vision has over the rest of us. Not because a whole new system of centralized planning would have to first be set up.

However decentralized in theory, market production is in fact organized through highly centralized systems—the command-and-control economy of the corporation, on the one hand, and the planning embodied in the financial system, on the other. As both Marx and Keynes recognized, the tendency of capitalism is to develop more social, collective forms of production, enlarging the domain of conscious planning and diminishing the zone of the market. The preservation of the form of markets becomes an increasingly utopian project, requiring more and more active intervention by government. Today, enormous public financing, investment, and regulation is required for our “private” provision of housing, education, and transportation.

Capitalism has been radically transformative and has expanded the scope of human life in ways that have been previously unimaginable. And yet, paradoxically, we remain trapped in a mental prison from which we cannot break out of. The Frederic Jameson line “It’s easier to imagine the end of the world than the end of capitalism” is evocative precisely because it so succinctly captures this paralysis.[16] We are inundated with endless disaster movies and catastrophic scenarios, but we cannot imagine a rational collective response to them, because we cannot envision a life not driven by the imperatives of self-expanding money value.

Alive in the Sunshine

We began this whole enterprise in these pages with the puzzle posed by the poster on the Lower East Side of Manhattan, whose reaching for a world beyond money was central to the genesis of this book. That location was a common site for us to meet and talk about these ideas in those years. The restaurant is long gone, one of the countless victims of the 2020 pandemic, and the poster may have moved on to other hobbies, or may still be looking for someone to teach them computers, or may have given up and paid for classes—who knows?

Another place that we spent discussing the ideas in this book for many hours over the years was a decidedly different one: Prospect Park in Brooklyn. On late spring weekend mornings, we would often take our kids there and have them play in the water park, swing from the monkey bars, chase the ice cream truck. On blustery fall afternoons, we would walk the pathways as the fallen leaves swept past our feet, contemplating some point we needed to work out. Occasionally, we would meet on hot and hazy summer afternoons and watch the college kids sling their frisbees and drink beer as the evening softened. At one point, we may have stopped to think—this was something that belonged to us, and it belonged to others, and it was nothing we needed to pay for. Yes, it does involve money in ways of provisioning—but that is not the point. The opportunity for any of us to be there was not restricted by how much we had in our pockets or bank accounts at the time, nor were the actions of individuals and groups who collected there driven by the need to have more money at the end of the day: we all just . . . were.

In many ways, we imagine moving to a decommodified world, a world where money ceases to drive us, may be a bit like stepping into Prospect Park. One goal in this book is to make space to imagine a world outside of money—to see it in relation to external social reality that is not capitalism. Not in order to escape from capitalism in our imaginations—that would be a delusion as long as it still organizes so much of our material existence. Rather, we hope it can help find an imaginative vantage point from which we can see it from the outside, in order to see the exit that we will follow in reality but can’t see while we are inside it.

Money, we suggested at the beginning of the book, is an invisible world, an immaterial spirit double that exists superimposed on the tangible material world. It is often a dark, malevolent divinity, compelling people to act in ways that seem perverse or self-destructive by everyday human standards. It is a force that is constantly reconstructing our world, whether we want it to or not. It is a force from which many of us would like to escape.

This book is not a how-to guide. We don’t want to claim that we have the ritual that will propitiate Moloch, or humanize the system by convincing people that He will accept a calf instead of a boy. We are not trying to smash up the temple and denounce the priests as frauds, understandable

though the temptation may be. That is not the way out. Instead, we can turn our backs on the idols, push the curtain aside, and walk out into the sunshine.

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Notes

Introduction

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Chapter One

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Chapter Five

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Chapter Six

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Chapter Seven

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